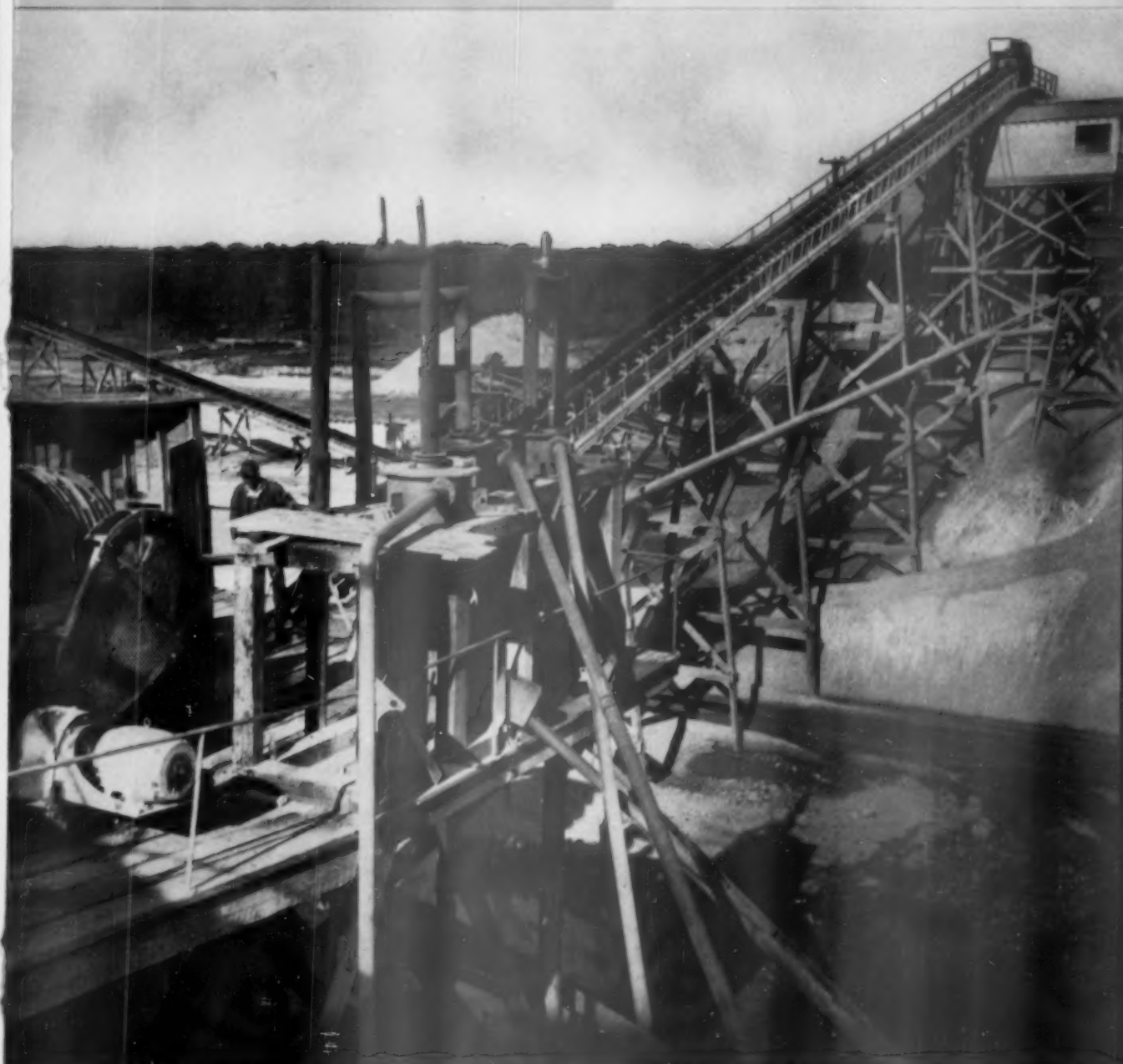


THE INDUSTRY'S RECOGNIZED AUTHORITY

# ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

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liquid cyclone section at Lillington, N.C. plant, Becker County Sand & Gravel Co.

**JUNE 1956**

# DENVER CAN SUPPLY COMPLETE EQUIPMENT FOR YOUR MILL

**One Responsibility**

**Crushers, Screens, Feeders, Ball-Rod Mills, Classifiers, Jigs, Pumps, Samplers, Agitators, Conditioners, Flotation, Thickeners, Filters, Dryers, Ore Testing and Mill Design Services.**

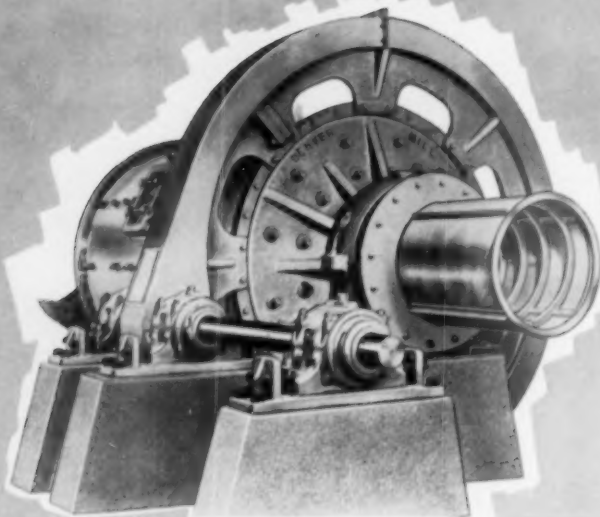


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# B.F. Goodrich



## It used to burn up every 6 months

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B. F. Goodrich belting to the hot material belt you see here. The heat ruined the regular belt as usual—but not the Solarflex. It has now outlasted three standard hot-material belts, is still going strong after two years.

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# ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

June 1956



ABP ... Fifty years ... 1906-1956 ...  
of Aid to Business Progress



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## CARBIDE INSERT? or MULTI-USE?



**LOCATION:** Cleveland Dam Project, Capilano River, Vancouver, B. C.

**DRILLING CONDITIONS:** Granodiorite.

## TIMKEN® carbide insert bits chosen in competitive tests for Cleveland Dam

**T**O insure the best bit performance on the Cleveland Dam Project, Capilano River, Vancouver, B.C., the contractor chose his bits through competitive tests. Several other makes of rock bits were tested, but Timken® carbide insert bits won out. They were used from the start of the job to the finish.

Timken carbide insert bits are most economical for constant-gauge holes, small-diameter blast holes and very deep holes. And they're your best bet for highest speed through hard and abrasive ground such as the very hard Granodiorite encountered on the Cleveland Dam job.

For drilling in ordinary ground, Timken multi-use bits are more economical. With correct and controlled reconditioning, you get the lowest cost per foot of hole when full increments of steel can be drilled.

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fine alloy steel. A special shoulder union, developed by the Timken Company, protects threads from drilling impact.

To be sure of getting the best bit for your job, call on the Timken Rock Bit Engineering Service. You may feel free to call on their twenty years experience at no obligation. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



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multi-use rock bit



Timken threaded  
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for the best bit...  
... for every job**

# TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

# 1,116,071 tons of ore



Unloading new Northwest Model 6 for trip to pit.

This Model 6 has been in the Granby Pits for 24 months with only 3 hours "down time."

## in 24 months



**W**E'VE SEEN A LOT OF RECORDS but this one is really among the topmost of them all. The illustrations show the pits of the Granby Consolidated Mining, Smelting and Power Co., Ltd., of Copper Mountain, B. C. The story should interest anyone handling rock.

The copper ore is being handled by two Northwests, Model 6's. The older of these two rigs went into service July 6, 1953, and as of July 6, 1955, it has been in the pits for 24 months. During that time it has loaded out 1,116,071 tons of ore and waste. Not only has it accomplished this tremendous production but it has done it with only three hours of "down time". Much of the credit for this high output goes to J. B. Logan and his crew of the J. B. Logan Construction Co. of Princeton, B. C., who are contracting the loading of the material.

Their personal interest in the job has played a big part in getting the best out of the equipment.

One of the most remarkable things about the performance is that Mr. Logan has moved all this material with only 4 sets of shovel teeth and still has the original four sets, less one tooth. The teeth are retipped and he gets 30 days single shift with each set of reconditioned teeth.

### FROM

July 6, 1953 to July 6, 1955:

Total shifts . . . . .	732
Total tonnage ore and waste moved . . . . .	1,116,071
Average tons per shift . . . . .	1484
Total down time . . . . .	3 hours

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This new CAT\* D8 Tractor, 'dozing river run gravel into a Kolman portable screen with 30-in. belt, keeps 30 trucks busy. The D8 with No. 8U Bulldozer, owned by Mercer-Fraser Co. of Eureka, Calif., is on the job 48 hours a week except when operations are flooded out by the Mad River.

"For this type of work, this new D8 is ideal. The U-type blade handles big loads, and the D8's ability to reverse fast saves time. This is the cheapest possible method of handling gravel. No wonder we're 100% Caterpillar owners," says Ralph W. Brown, president of Mercer-Fraser. The firm has five other Caterpillar track-type Tractors on this job, producing 2-in. screened gravel for a new four-lane freeway near Arcata, Calif.

The new Caterpillar D8 Tractor (Series D with torque converter, or Series E with exclusive oil clutch) is built to handle *more material at lower cost*. Its four-cycle, completely new Cat Diesel Engine develops 191 HP. It has new, easy-operating controls and "live-

shaft drive" that lets you operate rear-mounted equipment regardless of the flywheel clutch position.

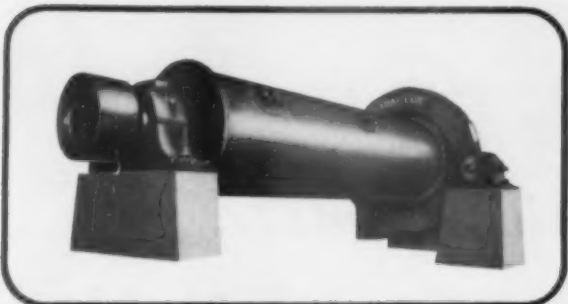
A full line of Caterpillar-built Bulldozer blades is available for the new D8. Their scientifically curved moldboards provide good shearing and fast-rolling loads, and their heavy-duty construction stands up to equipment-busting work around rock. Your Caterpillar Dealer—who provides fast service and dependable factory parts—will gladly demonstrate the new D8 Tractor. It can do the most work for *you* at the lowest cost. Call him today.

Caterpillar Tractor Co., Peoria, Ill., U. S. A.

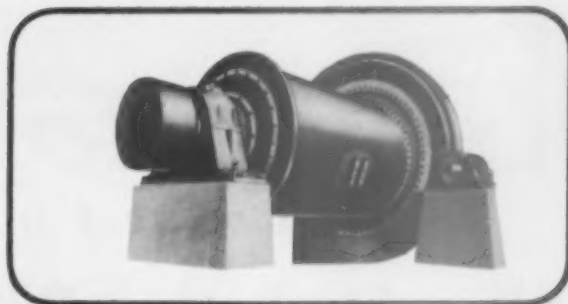
# CATERPILLAR\*

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**NAME THE DATE...  
YOUR DEALER  
WILL DEMONSTRATE**

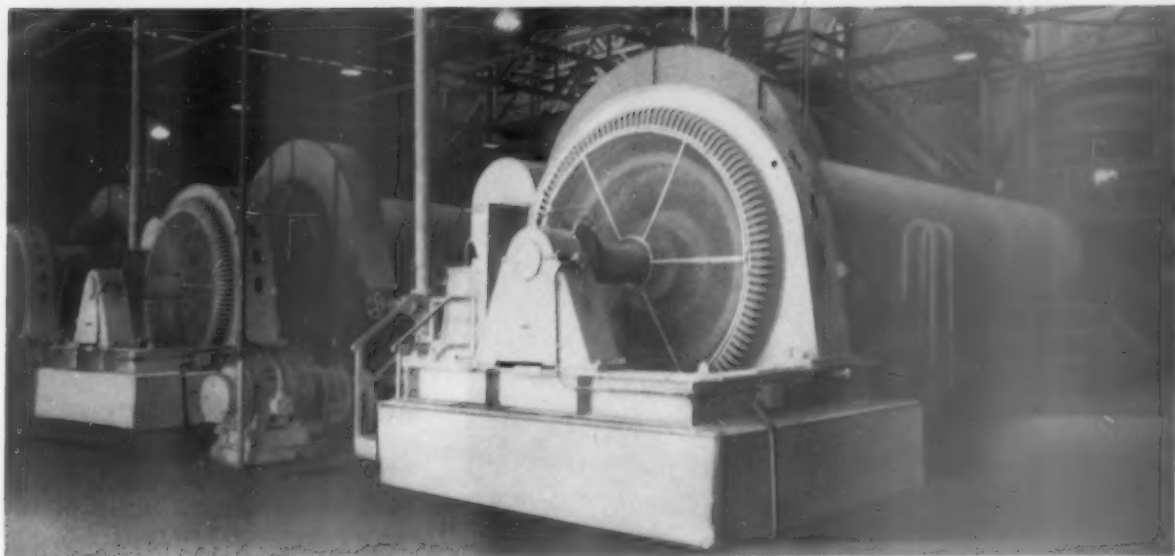


During the starting period, all main bearings on Traylor Grinding Mills are pressure-lubricated. A high pressure pump coats each trunnion with a film of grease which lifts and floats the mill to overcome high starting torques and eliminates undue wear caused by "dry" starting.



Precision-cut steel gears—trunnions cast integral with the detachable heads—shell liners of manganese or alloy steel . . . all indicate the superior design and construction features that are standard with Traylor.

## Here's How TRAYLOR Turns Any Grinding Operation to Your Advantage



Traylor Grinding Mills are custom-engineered to exacting specifications developed from two important sources . . . data furnished by you, the customer, and the knowledge of Traylor Engineers gained from more than a half-century of specialized experience.

The application of Traylor experience to your specific requirement makes a "Traylor-Made" Grinding Mill the most logical, advantageous choice for you. Traylor Bulletin #10-121 gives complete specifications and describes the outstanding features of Traylor Grinding Mills. Write for your free copy today.



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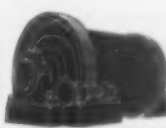
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*Here's why these motors can cut mining costs:*

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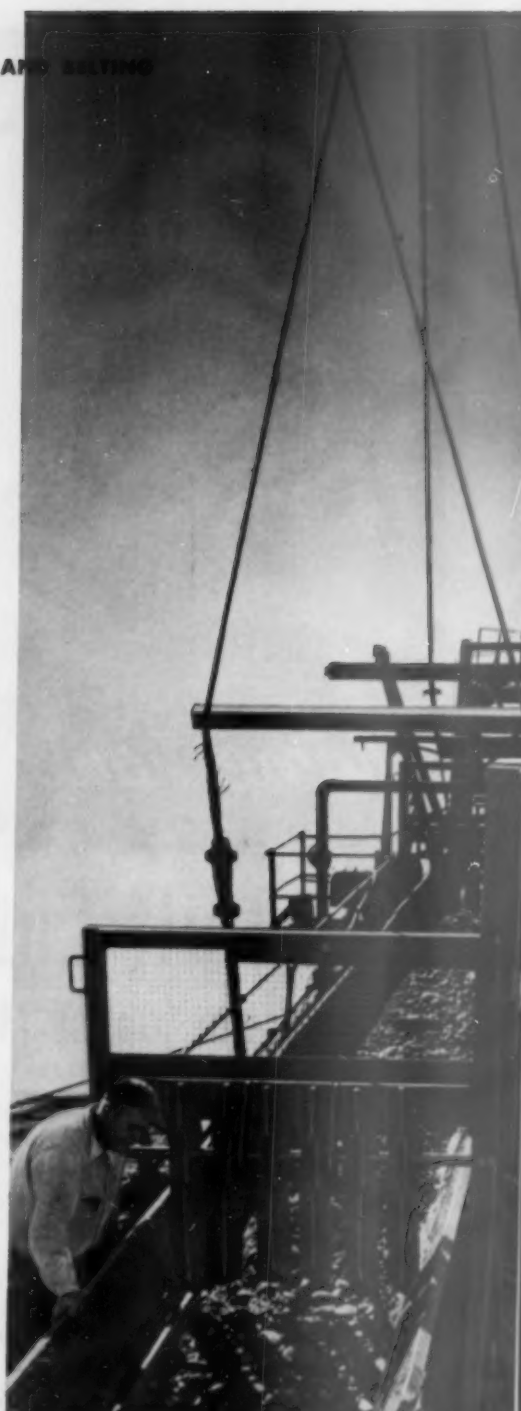
**INDUSTRIAL RUBBER PRODUCTS ARE A SPECIALTY WITH BOSTON,** not just a sideline. Boston designs and engineers each hose and belt to fit a specific job. As a result, you get better performance, longer life. Here's an example: at an aggregate plant in Virginia, a special Boston impact-resistant belt has given *five times more service* than any previous belt!

**YOUR BOSTON DISTRIBUTOR GIVES YOU FAST DELIVERY, TOO,** to keep production moving. He's your local Boston Man. Call him today for expert advice on the right hose and belt for you.



### **SPECIAL BOSTON DESIGN FOR EFFICIENT PERFORMANCE:**

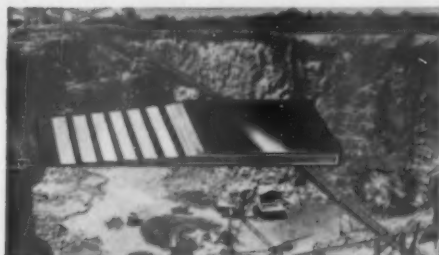
Cleaning up the loading area under a messy stacker belt is an expensive, time-consuming job. Boston Herringbone Stacker Belt solved that problem in the dredging operation of a California company shown at right. The special ridge design of this Boston belt prevents rock, sand, silt and water from sliding, regardless of the loading angle. That means less belt wear, more efficient operation and lower cleaning and maintenance costs.



INDUSTRIAL HOSE • FIRE HOSE • BELTING

ROCK PRODUCTS, June, 1956

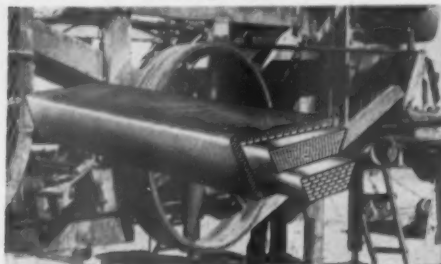
## BOSTON CHECKLIST FOR YOUR HOSE AND BELTING REQUIREMENTS



**BOSTON STOCK BELT:** Stock conveyor belts, like Boston Silver King, are made to last longer, even at high tensions, on heavy, long-distance hauls. That's because the plies of Boston belts are bonded at uniform tension to eliminate uneven stretch, give you greater economy, better performance.



**BOSTON AIR HOSE:** Designed for rugged service on air drilling rigs or pneumatic tools, all Boston heavy-duty air hose resists abrasion and shock, yet remains flexible and easy-to-handle. That's because they're engineered by Boston to stand up under the most severe working conditions.



**BOSTON ENGINEERED BELT:** Where stock belts will not fit a special conveyor system, Boston designs and engineers a belt to meet the exact requirements. Mildew-resistant Boston Herringbone Belt for instance, is specially engineered to prevent "creeking" on steep wet rock and gravel conveyors.



**BOSTON WATER HOSE:** From tough, abrasion-resistant covers, to flexible, rough and ready carcasses, Boston Water Hose, with working pressures up to 300 pounds, gives you years of economical service. See your Boston Man. He has Boston Water Hose in sizes to fit every requirement.

**BOSTON V-BELT:** The heart of a Boston V-Belt is its cord construction. Multi-ply cords, firmly bonded to the other sections, prevent excessive stretch; sturdy fabric covering prevents moisture and dirt from weakening cord construction. This means fewer adjustments, less slippage, longer life.

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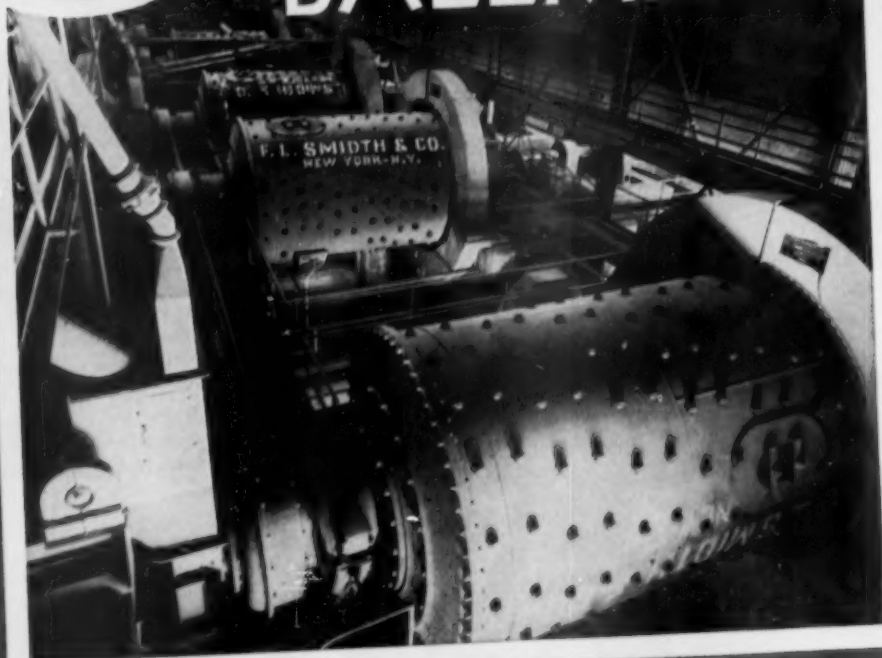
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# What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

June, 1956

**A 10-mile tunnel through solid rock** under Pittsburgh will form one of the main arteries in the Allegheny County Sanitary Authority's \$80,000,000 interceptor sewer system to help control water pollution in the Ohio River valley. Concrete caisson-type access shafts are being built, and the main interceptor will vary in size from 48-in. diameter to 126-in. diameter, the sewer proper being built of precast concrete. Downshafts will be drilled to connect the sewers, which now empty directly into the river, with the new interceptor. At the top of each downshaft will be a box-like reinforced concrete diversion structure that encloses the present sewer. The program, said to be the largest project of its kind, will relieve present pollution of the Ohio River by some 200,000,000 gal. of raw sewage daily from Pittsburgh and surrounding communities.

**Oil is becoming increasingly difficult and more costly to find** in the United States, according to William H. Miller, assistant general manager of sales promotion and advertising, Standard Oil Company of Indiana. He stated that further expansion should be aided by improved drilling techniques and production methods, and feasible recovery methods from oil shale and oil sands, coal and natural gas. Oil shale and oil sands together hold enough hydro-carbons to supply the country with liquid fuel for 100 to 300 years, according to Mr. Miller, and the point has been reached when extraction processes are commercially feasible.

**Railroad construction** in the first two months of 1956 was estimated at \$52,000,000, compared with \$39,000,000 during the same period of 1955, according to the Commerce and Labor Departments. New construction during the month of February amounted to about \$25,000,000, compared with \$27,000,000 in January and \$19,000,000 in February, 1955.

**Attesting to the "ageless" quality of concrete** is the condition of a concrete block revetment wall on the Miami River bank which was built there 35 years ago, following a flood in 1913. About 200,000 concrete block units, 2 in. x 1 ft. 5 in., used to build the revetment, were furnished by Price Brothers Company, and are expected to serve another 35 to 135 years.

**Silica sand is being used in the sand traps** at a Westchester, N. J., golf course. It provides an attractive appearance, being snow white, and is said to retain its whiteness, has no pebbles, and maintains its even texture, even after a rainfall. Another reported advantage is that a golfer's wedge does not cut into the silica sand as deeply.

**Heavy construction awards**, nationally, totaled \$8,010,983,000 for the first 18 weeks of 1956, as reported in **Engineering News-Record**. This was an increase of 29 percent above the corresponding period in 1955.

**The Leaning Tower of Pisa** has stood in apparent defiance of the laws of gravity for well over seven and one-half centuries, and should stand for at least another 750 years, if a novel and radical suggestion by Pisan authorities is put into effect. They suggest that the tower be dismantled stone by stone, and rebuilt at the precise spot where it is now on a massive concrete foundation. Observations of Prof. Giovanni Boaga of the University of Rome, Italy, show that the tower will fall within a comparatively short period of time unless something is done immediately. The problem became serious in 1940, when underground water began to flow between the foundation stones. Thousands of tons of cement were squirted into the foundation by means of special syringes, and also into the ground surrounding it. This stopped the seepage, but in 1946, the Arno river overflowed and water lapped the base of the tower. The tilt is increasing at a rate of about .027 in. annually, and at present, the eight-tiered tower, which is 184.42 ft. high, is 17.15 ft. out of line from its topmost point to the bottom of its foundations.

**One out of every 75 persons** in the United States became a traffic casualty in 1955, according to a report by the Travelers Insurance Companies, Hartford, Conn. Fatalities totaled 37,800 during 1955, the nation's worst automobile accident toll in history, compared with 35,500 in 1954. The injury count reached 2,158,000, compared with 1,960,000 in the previous year. The insurance company has prepared a 32-page cartoon booklet, entitled "Fatal Fallacies," listing accident statistics, and endeavoring to effect an awareness of highway dangers.

**Specially processed silica sand** is being spread on South Florida lawns, to help restore frostbitten, brown, dried-up looking lawns. The silica sand is said to be self-levelling, and makes the lawns firm. The sand also helps retain moisture in the winter months until the summer rains start, and is said not to disintegrate and blow away.

**American railroads** have been granted a freight rate increase by the Interstate Commerce Commission. The railroads had requested a 7 percent hike to offset more than \$500,000,000 annual increase in costs, due to wage, price and tax increases, but were allowed 6 percent by the Commission, with exceptions and maximums.

**Britain's Ballast, Sand and Allied Trades Association** recently announced a program to "stem inflation and the rising cost of living." A large majority of sand and gravel producers have agreed to keep their prices at existing levels until at least June 30, 1956.

**Two men escaped pursuing police** in a race to freedom from East to West Germany, despite the fact they were carrying a concrete mixer with them. As they neared the border, they veered their truck onto railroad tracks, avoiding a roadblock, and completed their bumpy dash to freedom.

**An atom-bomb-proof broadcasting station**, built into solid rock in the Stockholm, Sweden, suburb of Nacka, was provisionally tested on the medium wave lengths recently, with two masts each 636 ft. high.

THE EDITORS

Are you driving machinery under these

Motor killing conditions?

Dust-laden air

Corrosive conditions

Explosive vapors

Flood-out danger

## This New BJ Mechanical Drive Motor solves these problems!



The BJ Mechanical Drive Motor is available in sizes from 5 to 450 HP, 4 pole, and can be supplied to meet the special torque or horsepower and speed requirements of any particular application. Write for special BJ Mechanical Drive Motor information.

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**Miles of extra life, with extra-strong chassis features! Up to 3000 lbs. more payload than other 6-wheelers!**

• Ford's new T-800 is the lowest-priced in its class—based on a comparison of manufacturers' suggested list prices. It also carries up to 3000 more lbs. of payload compared to other tandems in the same GVW weight class!

## With a new combination of Safety Features available only in Ford Trucks

Deep-center Lifeguard steering wheel helps protect driver from steering post, in case of accident.

Double-grip Lifeguard door latches give added protection against doors flying open on impact.

New blowout-resistant tubeless tires—standard on all models. Ford seat belts at low extra cost.

Cut steering effort up to 75% with Master-Guide Power Steering. Standard equipment on T-800 models.

New wide choice of transmissions—all Synchro-Silent type.

Large-capacity flat tube fin radiator gives high cooling efficiency.

Long lasting Gyro-Grip clutch with low pedal pressure.

Easy-action front springs with double-wrapped rear eyes for added safety.

Spring-loaded tie rod ends take up wear automatically.

Faster starts, longer life with new 12-volt electrical system.

Greater economy, freer rolling, from third (inter-axle) differential in power divider.

33% longer rear brake life with new thicker linings.

Rugged truck foundation from deep-channel frames, among the strongest on any trucks.

No lubrication needed—rubber-bushed equalizing beams and torque arms.

## NEW FORD T-800 CHASSIS SHOWN

Max. GVW: 42,000 lbs., GCW: 65,000 lbs.

Axle ratings: Front 9,000 lbs. (11,000 lb. axle available)

Tandem rear: 34,000 lbs. (17,000 each axle)

Payload: up to 32,160 lbs.

Wheelbases: 144, 156, 175, 192 inches.

## Every major body builder builds for Ford...



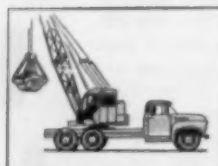
CEMENT MIXER TRUCK



DUMP TRUCK



DUMP WITH SCRAPER



TRUCK-MOUNTED CRANE

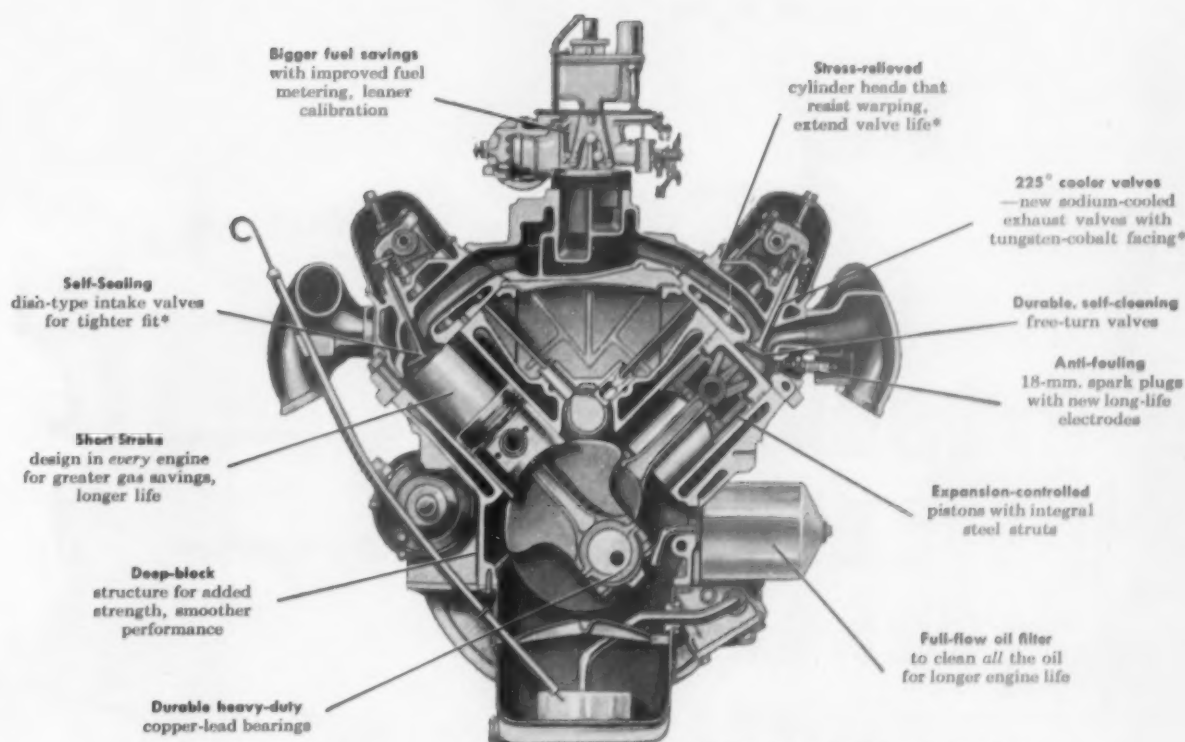


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# Tandem in its class-Ford T-800

**Longer-lived, dependable operation with exclusive heavy-duty engine features**

• '56 Ford Tandems offer you the most proven Short Stroke V-8 engines in the industry—for better gas mileage, longer life, less maintenance costs. And you get a combination of longer-lasting heavy-duty engine advancements found in no other truck. Ask your Ford Dealer for details.

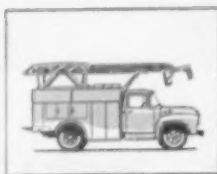


\*Features of new Ford Heavy Duty engines . . . 190-h.p. Torque King V-8 shown . . . 200-h.p. Torque King Special V-8 available.

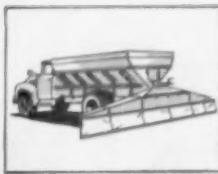
## More fleets are buying Fords than any other make



UTILITY TRUCK



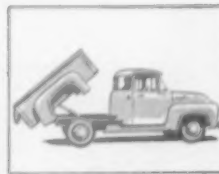
LINE TRUCK



LIME SPREADER



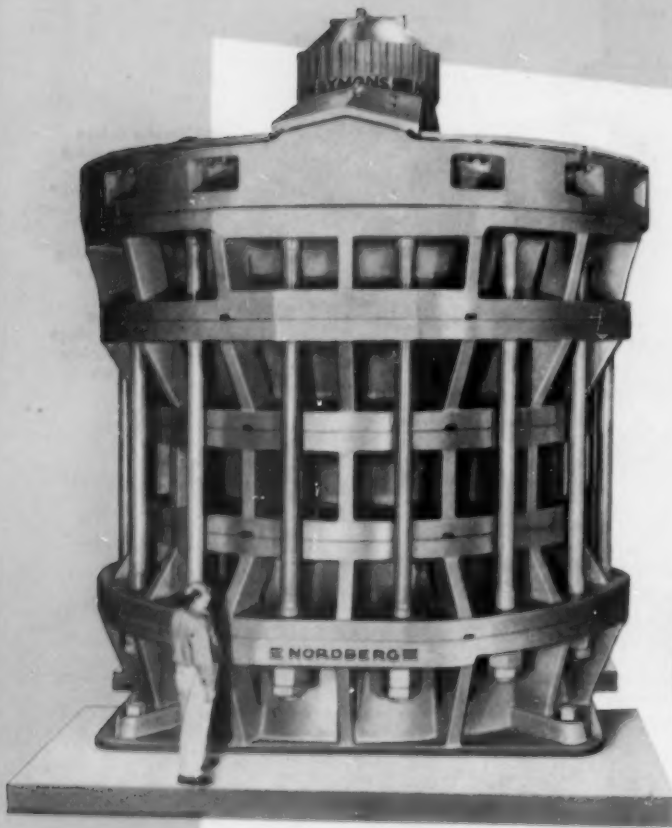
BITUMINOUS DISTRIBUTOR



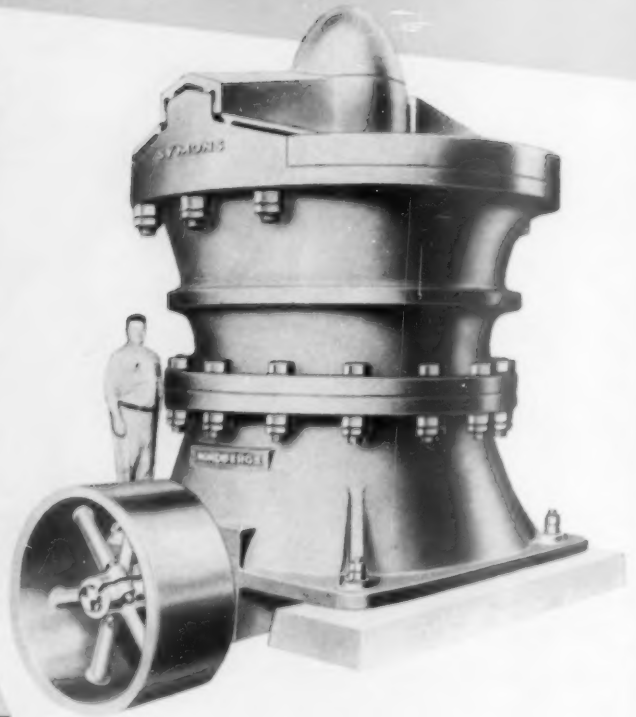
LIGHT DUTY DUMP

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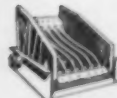
SYMONS 30" GYRATORY CRUSHER



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**SYMONS 7' EXTRA HEAVY DUTY CONE CRUSHER**

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**PREformed MONARCH WHYTE STRAND** meets the needs of your equipment—with flexibility, strength, and abrasion resistance!

There's no guesswork involved in getting the rope you need for scrapers, draglines, shovels or any other equipment. Any Macwhyte distributor can supply your needs from a thousand and one types and sizes of **MONARCH WHYTE STRAND**. These are supplied Internally Lubricated and **PREformed**, in Lang Lay or Regular Lay, with Independent Wire Rope Core or Fiber Core.

There are correct **MONARCH WHYTE STRAND** Wire Ropes for all equipment. Give this rope an opportunity to serve you—you will be more than pleased with its performance.

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**Macwhyte Company, 2949 Fourteenth Avenue, Kenosha, Wis.**

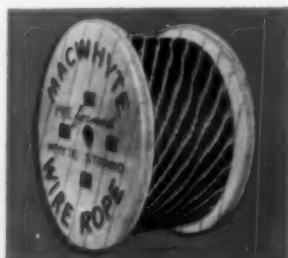
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Whether you need rope for scrapers, draglines, shovels, dozers, etc.—you'll find the Rope you need recommended in Booklet 53-25. Ask for your free copy from your Macwhyte distributor.

10000

## EDITOR'S PAGE

# FOR BETTER SERVICE...

**W**ITH THIS ISSUE, the editors of ROCK PRODUCTS launch a new program designed to save you reading time, improve our usefulness, and to otherwise better our product for your benefit. It's a big challenge, but we face it with courage because you asked for it. We're glad you did.

Because ROCK PRODUCTS already enjoys a wide reputation of authority and integrity in the industry, we anticipate your question: "How can it be done?" It's a good question. Yet, we feel it can be done by use of methods that will straighten the line of communication between us — to give you the data you want in the shortest possible space and reading time. That, essentially, is the gist of our improvement program. We hope to achieve our goal by attacking the project from four separate directions.

General appearance will be improved. Good design in a magazine page is not only desirable, it is a device that we believe will help us get information to you easier and quicker. Generally accepted practices of opening up editorial pages through the use of good layout, larger and more useful illustrations, and pleasing typography will be used. The idea is to tell a story through a bold, clean presentation.

Improvement of readability is one of our primary objectives. We want to tell the story in our pages as clearly and concisely as we can, but we want to make sure that all of the important information you want and need is there. Techniques can, and will, be used to give you the story we want to get across as rapidly and as completely as possible. Unnecessary words and "puff" phrases will be eliminated, while the necessary ones that tell the story quickly will be kept.

Central ideas of all articles and their sections will be moved to the front, so that no time need be lost in wading through paragraphs of material to reach the important thoughts. The detail — important detail — will be included, but it will be arranged properly after the projection of each idea or thought. Such arrangement, we feel, will cut your reading time per story. If we can save each reader five minutes' time for each of five stories per issue, we will have saved a collective 7,100 hours of valuable working time every month. That's our goal here, for you've told us time is important to you.

We shall strive for greater legibility. The combination of good appearance and readability will, we hope, allow for greater ease in reading. We're going on a word diet to keep down the weight of our copy, but the ingredients for good health in reporting will be maintained. Our physician — Dr. Arthur Gould, Medill School of Journalism, Northwestern University — will give us the proper advisory direction.

You've told us that the scope of ROCK PRODUCTS should be enlarged, so we're going to attempt it.



George C. Lindsay

More articles that discuss major industry problems will be published. It's our responsibility to cover **all phases** of the industries we represent, whether they concern production or management. We shall continue to present articles on new and representative plant installations and those on various phases of operation, plus technical material, as we have in the past.

So, our basic aim is to make our stories easy to look at, easy to read, and easy to understand — for engineers, operators and management. It will take time — lots of time — to reach our ultimate goal. In the meantime, we will check with you to see how you like what we're doing, and will be guided accordingly. The first attempt in our new program will be found on page 78 of this issue.

Your comments are solicited.

*George C. Lindsay*

**46%**

of All  
**EAGLE Aggregate  
Washing-Classifying  
Equipment Sales  
are REPEAT  
Sales!**

Yes, 46% of the sales of EAGLE Sand and Gravel, Crushed Stone and Ore Processing Equipment are repeat sales—a great many producers have purchased repeatedly—some as many as 25 or more times.

Aggregate producers are necessarily cost-conscious and performance-conscious—if they come back for more of the same equipment, it must be right. The fact that so many have bought again and again—proves that their original investment in Eagle Equipment really paid off.

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Hallett Construction Co. and subsidiaries bought their first Eagle Equipment in 1929. Their 45th Eagle installation, at Marlboro, S. C., is shown above.

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FOR SEVERAL YEARS NOW we have been using this page to emphasize that any real progress in future research on cement and concrete must come from a better understanding of the actual chemical structure of these materials. Experimental results, or empirical formulas, can be, and of course have been, very helpful in design and use of cement and concrete, but they never can, alone, be of much help in explaining the true nature of these materials.

Such progress as has been made in the kind of research we refer to, in case of cement and concrete, has been slow and difficult because we are dealing not with simple chemical elements, where old-time chemical formulas told a sufficient story of the reactions, but with complicated colloidal sols and gels, no two of which actually encountered in practice are identical.

Researchers engaged in this kind of cement and concrete study are few and far between, and probably their work and aims are not well understood or appreciated. However, concurrently a vast amount of research has been going on in other branches of the silicate industries, and there is a rapidly growing volume of literature devoted to the silicates, both theoretical and practical. It has been our aim to bring to the attention of those interested these sources of information, because we hope to stimulate more of that kind of research in the cement and concrete industries; and because we wish to prepare our readers for understanding the language in which such research must necessarily be written—the language of *structural silicate chemistry*.

### Two New Books

Modern structural chemistry is a much more interesting and satisfactory study than the kind that was studied up to 20 or 25 years ago. From present theories on the structure of atoms, the central nucleus (of protons and neutrons) and the surrounding electrons (negatively charged) not only are the many chemical reactions explained, but it can be foretold whether or not any reactions at all between certain atoms can take place, and if they do occur what the resulting molecules or crystals will be like.

In these pages we have attempted to describe in understandable terms

chemical reactions and the structures of those elements with which a study of cement and concrete is most concerned. We have of necessity oversimplified the subject. For those who are really desirous of getting a working knowledge of the subject there is a very new textbook that we can recommend. Its title is "Inorganic Reactions and Structure"\* by Dr. Edwin S. Gould, Polytechnic Institute of Brooklyn, N. Y. It is designed for college students, and hence the language is no more difficult to understand than would be expected for those beginning a course in this subject. Many texts are available on organic structural chemistry, but the whole subject of inorganic structural chemistry is so new that a few general elementary textbooks are available.

In his preface the author states: "My object is twofold. First, some of the modern structural concepts are to be presented on a moderate enough level to allow the chemistry student with only an average background in college mathematics and physics to appreciate the applicability and limitations of the newer ideas. Secondly, the students' knowledge of reaction chemistry is to be extended and strengthened, using recent interpretations where feasible. The chapters predominantly theoretical in approach have been alternated with those predominantly 'descriptive' in approach where possible. It is my own experience that large doses of either type are not as effectively assimilated as small alternate doses of both."

In our previous articles we have not attempted to explain in detail the part played by electrons in forming chemical bonds because much of the theory was beyond our own comprehension, as well as because we doubted if any of our readers wanted to pursue the subject that far. The book before us explains some of these theories much better than previous texts we have reviewed, so that even the layman can get some idea of such obtuse subjects as the "quantum numbers" of electrons, the screening effect and ionization potential, etc.

There is a chapter on "Ionic Crystals," which should be helpful in study-

ing cement, since so far as anyone knows at this time, hardened cement is a solidified gel composed of tiny crystals, held together largely by some type of ionic bond. The following chapters discuss the elements which form ionic bonds including those in cement and concrete. Of special interest, of course, are the discussions of silicon, silica and the silicates, and of the alkaline earth metals (calcium, etc.). Briefly, as can be seen from the foregoing, the book is an authoritative text on the new inorganic chemistry that all who want to understand cement and concrete must eventually study.

### Silicic Science

The second book we had reference to in our opening paragraphs is entitled "Silicic Science,"† by the late Dr. Ernst A. Hauser, of the Massachusetts Institute of Technology. Dr. Hauser died shortly after his book was published. All industry concerned with what he termed "silicic science" suffered a severe loss in his death at 59. We were familiar with his work and had carried on a correspondence with him for several years. We had always hoped that some day he would turn his attention to the silicates in portland cement. As it was, while he was fully aware of the similarity of problems in the clay and cement industries, all his professional papers and this book had to do mostly with silicates as found in clays.

Dr. Hauser was a great advocate of colloid chemistry and his book is on silica in its colloidal state. In Chapter III in which the author explains the terms used, he writes: "A careful study of all the literature on silicates and silicon derivatives shows that it still does not offer truly satisfactory explanations for many of the properties exhibited by siliceous matter. Organic chemistry was exactly in the same position when it became evident that this discipline alone was unable to account for many properties exhibited by certain organic compounds, for example, the high viscosity of some of their solutions, gelation, thixotropy, elasticity, plasticity, and many other phenomena."

The composition and structure of siliceous compounds is explained in more detail than we have seen else-

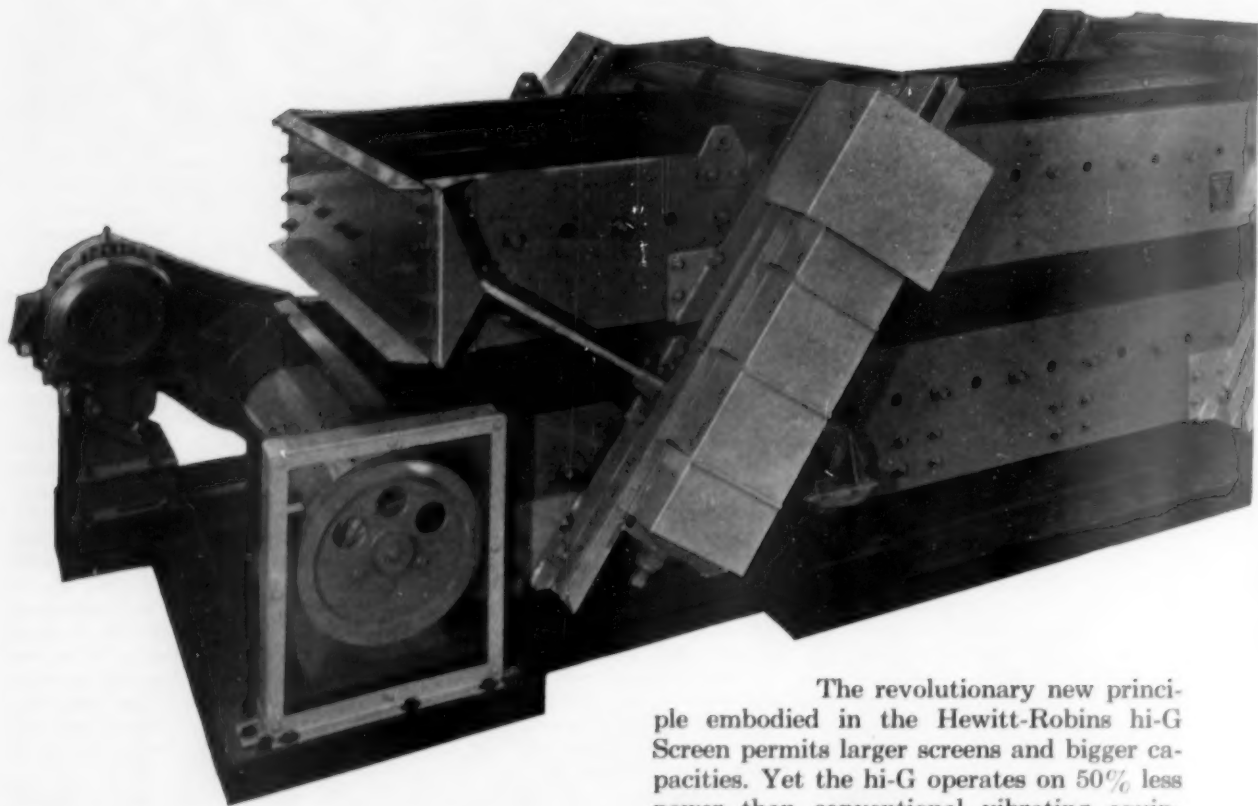
(Continued on page 178)

\*Published by Henry Holt and Co., 383 Madison Ave., New York 17, N. Y.; price \$6.75.

†Published by D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N. J.; Price \$5.00.

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"GLIDE RIDE" THE NEW MOVING SIDEWALK

The revolutionary new principle embodied in the Hewitt-Robins hi-G Screen permits larger screens and bigger capacities. Yet the hi-G operates on 50% less power than conventional vibrating equipment! Even screens as large as 6' wide by 28' long require no more than a 20-HP drive.

Featuring an unusually sharp screening action, and a choice of stroke and speed combinations, the hi-G can be made in larger sizes than any other vibrating screen on the market.

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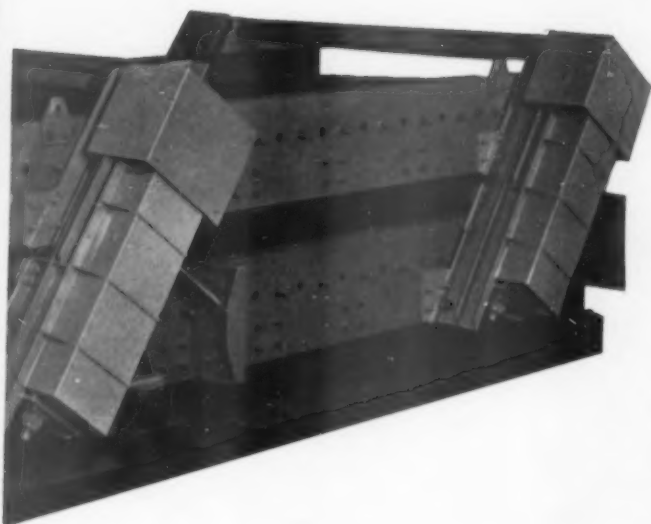
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If you need larger screens—screens that operate on or near the horizontal and still screen at large openings—*screens with readily accessible lower decks for easy observation, spraypipe installation and quick cloth changes . . .* the hi-G Screen is your answer. For information about hi-G Screens and other Hewitt-Robins vibrating equipment, contact our nearest sales office or write to our offices in Stamford, Connecticut.

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Drills to draglines—  
**A CAT\* ENGINE  
PAYS OFF  
IN ANY RIG**



A Caterpillar D318 Engine provides power for the compressor and drill on the end of the boom at Bryan Rock & Sand Co.'s quarry at Rolesville, N. C. Working 10 hours a day in hard rock, this rugged Cat Diesel pays off in power. "We've had very good service from this equipment," says J. D. Stowe, superintendent.

This is a typical installation of a Caterpillar Engine. There's a rugged Cat Diesel for practically every excavator, compressor and other quarrying equipment ever built. The D318 shown here delivers 119 HP. There are other compact, versatile, easily installed Caterpillar Engines in a range up to 650 HP (maximum output capacity).

All of them have such Caterpillar long-life features as "Hi-Electro" hardened crankshaft and cylinder liners, aluminum alloy bearings, highly effective fuel, air and oil filters, and tinker-free fuel injection systems. They will operate cleanly and efficiently on such low-

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Leading manufacturers can install Caterpillar Engines as original power in their equipment. Or your Caterpillar Dealer can advise you about the engine best suited to your present equipment when it's time to repower. Ask him for full facts and figures on the Caterpillar Diesel Engine or Electric Set that can do most work for *you* at lowest cost. And rely on him whenever you need skilled, factory-trained service or parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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**MODERN  
HEAVY-DUTY POWER**

# LABOR RELATIONS TRENDS

NATHAN C. ROCKWOOD

## Supreme Court Decision on Labor Racketeering

**P**RODUCERS IN OUR INDUSTRIES have, most unfortunately, to deal with certain labor unions in which plain racketeers are in control. One of the worst offenders, as many of our readers know, is the Operating Engineers' and affiliated Common or General Laborers' locals. The power shovels, cranes, draglines, etc., of producers of rock products are largely manned by members of the Operating Engineers' locals. The calibre of members in general is high and often blameless, yet the national or international union is still controlled by men who already have been in jail for racketeering, or men who should be in jail. At the recent Chicago convention of the Operating Engineers, the same old gang kept control, in spite of efforts of reformers to get rid of them, and in spite of much unfavorable publicity in the Chicago newspapers, until reporters were barred from the meetings.

However, a decision of the United States Supreme Court in the case of the United States v. Green and the General Laborers' Local No. 397 of Granite City, Ill., gives some encouragement both to employers and the many honorable members of these unions. The case involved the attempt of a union officer to force an employer to take on employees who were not needed, or what is known as "featherbedding," by use of strikes or threatened strikes. The question at issue was the legality and application of the Federal Anti-Racketeering Act. Strange as it seems, the Court's opinion was not unanimous; three justices, including the Chief Justice, dissented but on technical grounds, rather than in sympathy with the defendant's arguments. What follows is the full text of the decision, and of the dissenting opinion, including the accompanying footnotes.

"An indictment was found in the Southern District of Illinois against appellees Green and a local union. The jury adjudged them guilty under counts one and two thereof. The court sustained their separate motions in arrest of judgment setting out in its order that its action was 'solely' on the following grounds:

"(2) This court is without jurisdiction of the offense.

"(b) The facts alleged in the Indictment failed to set forth an offense against the United States such as to

give this Court jurisdiction.

"(c) A proper construction of the statute in question clearly indicates that it does not cover the type of activity charged in this indictment; to interpret the Act in question as covering the type of activity charged in this Indictment is to extend the jurisdiction of this Court and the power of Congress beyond their Constitutional limits."

"Appeal was taken by the United States directly to this Court [the Supreme Court] under 18 U.S.C. § 3731.<sup>1</sup> We noted probable jurisdiction. 350 U.S. 813.

"The two counts in question were based upon alleged violations of 18 U.S.C. § 1951, popularly known as the Hobbs Act. The pertinent statutory provisions are subsections (a) and (b) (2) thereof, reading as follows:

"(a) Whoever in any way or degree obstructs, delays, or affects commerce or the movement of any article or commodity in commerce, by robbery or extortion or attempts or conspires so to do, or commits or threatens physical violence to any person or property in furtherance of a plan or purpose to do anything in violation of of this section shall be fined not more than \$10,000 or imprisoned not more than twenty years, or both.

"(b) \* \* \*

"(2) The term 'extortion' means the obtaining of property from another,

<sup>1</sup> "An appeal may be taken by and on behalf of the United States from the district courts direct to the Supreme Court of the United States in all criminal cases in the following instances: \* \* \*

"From a decision arresting a judgement of conviction for insufficiency of the indictment upon the invalidity or construction of the statute upon which the indictment or information is founded."

"The opinion states:

"It is now contended that the Indictment does not state a cause of action within the meaning of the above section. In the usual extortion case, the extorter is obtaining money or property of another for his own benefit. \* \* \* In the case at hand, I conclude that Green's original activity in 'attempting to obtain from Arthur W. Terry, Jr., his money in the form of wages to be paid for imposed, unwanted, superfluous and fictitious services of laborers' which said charge was seriously controverted, was of itself not a violation of this statute, and within his rights and responsibilities as a Union representative, which was not prohibited by this statute.

"\* \* \* I conclude that the trouble in this Community and on this particular job was caused by a disagreement between the contractor and labor, and was in no wise an attempt to extort for the use of either the Union or the Defendant Green, any money or property of the contractor." 135 F. Supp., at 163, 164.

<sup>2</sup> See American Newspaper Publishers Association v. Labor Board, 345 U.S. 100; Labor Board v. Gamble Enterprises, 345 U.S. 117.

with his consent, induced by wrongful use of actual or threatened force, violence, or fear, or under color of official right."

"Each of the two counts charged appellees with acts of extortion under 1951 directed against a different employer. The extortions alleged consisted of attempts to obtain from the particular employer

"his money, in the form of wages to be paid for imposed, unwanted, superfluous and fictitious services of laborers commonly known as swamper, in connection with the operation of machinery and equipment then being used and operated by said employer in the execution of his said contract for maintenance work on said levee, the attempted obtaining of said property from said employer as afore-said being then intended to be accomplished and accomplished with the consent of said employer, induced and obtained by the wrongful use, to wit, the use for the purposes aforesaid, of actual and threatened force, violence and fear made to said employer, and his employes and agents then and there being; in violation of Section 1951 of Title 18, United States Code."

"Appellees each filed motions for acquittal or in the alternative for a new trial. These the trial court specifically denied. The opinion of the trial court, 135 F. Supp. 162, says nothing as to failure of evidence to support the allegations of the indictment, or as to trial errors. Instead the court relied upon the absence of criminality in the acts charged, and it was therefore logical for the trial court to deny acquittal and new trial." The court thought persuasive our recent cases which held union efforts to secure 'made work' for their members were not unfair labor practices.<sup>2</sup> From its view that extortion as defined in the Hobbs Act covers only the taking of property from another for the extorter's personal advantage, the necessity to arrest the judgment followed. Rule 34, Fed. Rules Crim. Proc.

"We do not agree with that interpretation of the section. The Hobbs Act was passed after this Court had construed §2 of the Federal Anti-Racketeering Act of 1934, 48 Stat. 979, in United States v. Local 807, 315 U.S. 521. Subsection (a) of §2 barred, with

(Continued on page 151)

## KOEHRING WORK CAPACITY *in action . . .*



**At a Mid-West quarry,**  $\frac{3}{4}$ -yard 305 loads out lannon stone. It's another in a new series of Koehring machines, and is similar in basic design to the modern new  $\frac{1}{2}$  and 1-yard excavators. Has full complement of standard attachments, on crawlers and rubber (see capacity chart below).



**Plenty of pick-up** — At an isolated camp in the Sierras, pumps and other machinery had to be unloaded and set in place. The heavy units required careful, precision-handling — and plenty of lift capacity. Above photo shows how they did it with a Koehring 15-ton 205 truck crane.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES	
		<small>(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)</small>	
205 CRAWLER	$\frac{1}{8}$ -Yd.	20,000 lbs.	at 10-foot radius
305 ON RUBBER	$\frac{1}{8}$ -Yd.	30,000 lbs. 13,700 lbs.	at 12-foot radius at 20-foot radius
305 CRAWLER	$\frac{1}{4}$ -Yd.	30,000 lbs.	at 12-foot radius
305 ON RUBBER	$\frac{1}{4}$ -Yd.	50,000 lbs. 18,800 lbs.	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-foot radius
605 CRAWLER	1 $\frac{1}{2}$ -Yds.	72,300 lbs.	at 12-foot radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 13-foot radius

Want more information? Call Koehring distributor today.



**Big producer** — Deep stripping uncovered a heavy coal vein at this Eastern mine. Working on mine floor, a Koehring 605 shovel loaded out the coal, and dumped into trucks spotted on upper level. Depending on materials, and type of operation, the 605 can be used with standard 22-ft. shovel boom and 16 $\frac{1}{2}$ -ft. dipper-sticks — or with high-lift 28-ft. boom and 23-ft. dipper-sticks.



K003



Unloading barges along a Southern bayou, Koehring crane handles 1½-yard clamshell bucket on 50-foot boom. This 405 is a new size in Koehring heavy-duty line. Boom lengths range from 40 to 90 feet for clamshell or drag-line stripping and stockpiling. It has 20-ton crane capacity — converts to 1-yard shovel or hoe.

**KOEHRING COMPANY** Milwaukee 16, Wis.

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PARSONS • Kwik-Mix

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Wagon Drill that  
really gets around!



## the G-800 Tracdril

- Self-Propelled
- One-man  
Operated
- Tows Own  
Compressor

Combine the drilling speed of the hard-hitting CP-70NDC Drifter with the adaptability of a CP Drill Carriage and U-arm... add the maneuverability of a self-propelled track-mounting that tows its own air supply over rough terrain... and you have the One-Man CP Tracdril.

Reversible tramming motors enable the Tracdril to go forward, backward and pivot

... for faster "moving time" from hole-to-hole, more accurate spotting and more time for productive drilling. "Knee-action" tracks keep the hydraulically operated U-arm support level when operating on uneven ground. The Tracdril has plenty of reserve power... can tow a 13,000 pound CP 900 c.f.m. Rotary Compressor up a 10% grade. For details see your CP equipment distributor.



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# PEOPLE IN THE NEWS

## Penn-Dixie Appointments

FRED L. DOOLITTLE has been elected executive vice-president and a member of the board of directors of Penn-Dixie Cement Corp., New York, N. Y. L. L. Van Nest has been named to succeed him as vice-president and general sales manager. Hugh R. Hamilton has been appointed vice-president and assistant to the president, and H. L. Silcox has been made vice-president for operations. John H. Jones replaces Mr. Silcox as operations manager and Donald L. Hensley succeeds Mr. Van Nest as assistant general sales manager.

Mr. Doolittle joined the Boston office of Penn-Dixie in 1929. He was appointed assistant sales manager of the office in 1939 and became assistant sales manager of the New York district office in 1941. Four years later he was named general sales manager.

Mr. Van Nest became associated with the company in 1941 as assistant sales manager in New York after 14 years with Lehigh Portland Cement Co. He was appointed assistant general sales manager of Penn-Dixie in 1945.

Mr. Hamilton started his career in the cement industry with Lehigh Portland Cement Co. in 1928. He joined the sales department of Penn-Dixie in 1939 and was appointed assistant to the general sales manager in 1945.

Mr. Silcox has served Penn-Dixie or a predecessor company since 1921 as a plant chemist. He became manager of the Clinchfield, Ga., plant in 1945 and assistant operating manager in 1952. He was named general operating manager in 1955.

Mr. Jones joined the company in 1948 as an engineer in the Nazareth, Penn., office. He became engineer of the Bath, Penn., plant in 1950 and later served in the same capacity at



Fred L. Doolittle

the Clinchfield plant, where he was named superintendent in 1952. He became superintendent of the Nazareth plant in 1954 and operating assistant in 1955.

Mr. Hensley became associated with the cement industry in 1939 and joined the Boston office of Penn-Dixie in 1942, later transferring to the New York sales offices, where he was appointed New York district sales manager in 1947.

## P. C. A. Engineer

HOWARD A. KELLY, JR., has been appointed public works engineer of the Portland Cement Association in New York counties of Columbia, Ulster, Orange, Dutchess, Putnam, Rockland and Westchester. For the past seven years he has served as resident engineer of the New York State Department of Public Works. He attended Manhattan College and was graduated from New York University with

a B.S. degree in civil engineering. He has completed graduate studies for a master's degree in transportation engineering and urban planning.

## Philip Carey Promotions

H. ROSS BARRETT, formerly vice-president-controller and vice-president-finance, has been promoted to executive vice-president of The Philip Carey Manufacturing Co., Lockland, Cincinnati, Ohio. Earl C. Faulkner has been named vice-president in charge of the western division; Clarence E. Howard, vice-president in charge of the eastern division; Edgar A. Boadway, vice-president in charge of the Canadian division; and Edwin F. Ziegenhardt, controller.

## President Retires

R. G. L. HARSTONE has retired as president of the Canada Crushed and Cut Stone Co., Ltd., Hamilton, Ontario, Canada, after 35 years of service. He will be succeeded by D. H. Henderson, president of Queenston Quarries, Ltd. Directors include G. G. Ryan, president of L. G. Beaubien & Co., Montreal, and E. H. Sancton, general manager, Steetley of Canada Ltd.

## Lewis Sanderson Retires

LEWIS R. SANDERSON has retired as president of National Gypsum Co., Buffalo, N. Y., and will be succeeded by Fred A. Manske, executive vice-president. Melvin H. Baker, chairman of the board, continues as chief executive officer. Wells F. Anderson, operations vice-president, succeeds Mr. Sanderson as a director and has also been named senior vice-president.

A new policy board composed of the president and the two senior vice-presidents, Wells F. Anderson, and



L. L. Van Nest



Hugh R. Hamilton



H. L. Silcox



John H. Jones



Donald L. Hensley



**Fred A. Manske**

John W. Brown, vice-president in charge of marketing, has been formed.

Mr. Sanderson has been president of the company since 1951. A native of Des Moines, Iowa, he entered the gypsum industry in 1914 soon after graduation from Iowa State College, Ames, Iowa. He was manager of the New York City plant of the Atlantic Gypsum Co. when it was purchased by National Gypsum Co. in 1936, and continued in that position. During World War II he was head of the Bluebonnet, Texas, Ordnance plant which the company built and operated for the government. In 1945 he was transferred to Buffalo and named director of construction and reconversion, directing the company's \$78,000,000 expansion and modernization program. Later he was promoted to vice-president and director, and became executive vice-president in 1950.

Mr. Manske was born in Chicago, Ill., and soon after his graduation from the Armour Institute of Technology entered the gypsum industry as a sales correspondent. Subsequently he became field market supervisor and research engineer, securing 20 patents on his inventions. He joined National Gypsum Co. as assistant to the vice-president of operations in 1934. Two years later he was made production manager in charge of eight plants which later were increased to 12. In 1949 Mr. Manske was appointed general production manager in charge of all plants and the Nova Scotia quarries. Later that year he was made vice-president of manufacturing and in 1951 was named vice-president of operations and a director.

Mr. Anderson, born in Tomah, Wis., was graduated from the University of Wisconsin, Madison, Wis., where he received master of science and doctor of philosophy degrees. He joined National Gypsum in 1951 as production

manager and later became vice-president of manufacturing

### **I.M.C.C. Appointments**

**WILLIAM BELLANO** has been appointed director of mining and minerals exploration, International Minerals and Chemical Corp., Chicago, Ill. He was formerly production manager for the Bonnie phosphate chemicals plant and prior to that was manager of general engineering services for the central engineering division. He has had over 19 years of mining experience in the United States and abroad, and will make his headquarters at the general offices in Chicago, Ill.

**Max H. Forster** has been named management development supervisor and will serve as staff specialist on selection and development of managerial and technical personnel. He was formerly training director for S. C. Johnson & Son, Inc., Racine, Wis., and



**William Bellano**

had previously been associated with Caterpillar Tractor Co. as personnel consultant.

**Rune E. Swanson** has been appointed controller. He was formerly assistant controller of U. S. Gypsum Co. where he previously also served as administrative assistant to the chairman of the board. He holds a B.S. degree in commerce from Northwestern University, with majors in general business and accounting.

### **Riverside Appointments**

**JOHN M. KINARD** has been elected vice-president and general manager of Riverside Cement Co., Los Angeles, Calif. Formerly in charge of production operations at the Crestmore and Oro Grande plants in Southern California, Mr. Kinard received his B.S. degree at Occidental College, Los Angeles, and his M.S. degree at Harvard



**John M. Kinard**

Graduate School of Business. He is a member of the General Technical Committee of the Portland Cement Association.

**David C. Honey** has been appointed assistant secretary in addition to his duties as assistant to the vice-president and general manager, in charge of the company's program of research in the field of industrial engineering and quality control. A member of the American Institute of Industrial Engineers, Mr. Honey received his B.S. degree at Yale University, New Haven, Conn., and his M.S. degree in business administration at Harvard Graduate School of Business.



**John P. Kinville**




### **Vice-President Retires**

**JOHN P. KINVILLE** has retired as vice-president of the Michigan Limestone Division, U. S. Steel Corp., Detroit, Mich., after 40 years of service. He was born in Black River, Mich., and studied accounting and business administration at Ferris Institute, Big Rapids, Mich. He joined U. S. Steel



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industrial buckets. 



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WILLIAMS BUCKET DIVISION — THE WELLMAN ENGINEERING CO. — CLEVELAND 14, OHIO

Corp. in 1916 as accountant with the Michigan Limestone and Chemical Co., Rogers City, and was appointed treasurer in 1922. In 1940, he was made comptroller and in 1951 was named treasurer and assistant to the president. He was promoted to vice-president of Michigan Limestone in 1955.

### With Mexican Cement Firm

DONALD L. DERROM has been engaged for two years in reorganizing the manufacturing and engineering phases of Cementos Anahuac, S. A., Mexico City, Mexico, on loan from his regular employer, Kennedy-Van Saun Manufacturing & Engineering Corp., New York, N.Y. He informs us that he has now been operating five kilns on constant speed for over 26,000 kiln-hours. He is also operating Fuller clinker coolers on a constant speed basis, with timer control. They have developed a twin-screw feeder system in which one screw is on constant speed and the other timer-operated (independent motors), and thus are able to get extremely close feed adjustment, which is "the secret of our success." They are also increasing rather than decreasing the speeds of the kilns, thereby proving that the old incline of  $\frac{1}{2}$  in. per ft. of kiln is more effective than the more modern  $\frac{3}{4}$  in. per ft.

### Ideal Promotions

E. F. BOLLINGER has been promoted to Pacific regional production manager of Ideal Cement Co., Denver, Colo., succeeding A. G. Lang, who has been appointed consultant on engineering and construction of the Pacific division. A. W. Hooton has been named production manager of the Rocky Mountain region. Other appointments include J. C. Andrews, who has been transferred to the Boettcher, Colo., plant as plant manager, with G. N. Davis as assistant plant manager; C. S. Burris, who has been transferred from Trident, Mont., to Devil's Slide, Utah, as plant manager; W. S. Fogelberg, plant manager at Baton Rouge, La.; Harold Lamont, plant manager at Trident, Mont., succeeding Mr. Burris; Horace Straight, plant manager at Portland, Colo., and J. L. Baxter, assistant plant manager at Redwood City, Calif.

### Concrete Association Officers

PETE MUTH, Orco Block Co., Stanton, Calif., was elected president of the Concrete Masonry Association, California, at the annual convention held recently at La Jolla. Tom Jamieson, Angelus Block Co., Burbank, was

elected vice-president; Roy Beal, Roy S. Beal, Inc., El Monte, secretary; and E. Lyman Chaffee, O'Kelley-Eccles Co., Baldwin Park, treasurer. Installations were made by Sam Hobbs, engineer of structures of the Portland Cement Association, and an honorary member of the Concrete Masonry Association.

## OBITUARIES

DR. F. O. ANDEREGG, internationally known as an authority on construction materials, and for many years a contributing editor to *ROCK PRODUCTS*, passed away suddenly on May 5. A consulting physical and chemical engineer, he reviewed foreign language literature for *ROCK PRODUCTS* and contributed the benefit of his experience for the rock products industry in industry contacts and in authoritative articles. Formerly a professor on construction materials at Purdue University, for many years he was director of building materials research at John B. Pierce Foundation, Raritan, N. J., and was a member of the American Society for Testing Materials and the American Concrete Institute. At the time of his death, Dr. Andereg was consulting specialist on building materials.

WILLIAM B. SENSEMAN, western division manager of the Raymond Division of Combustion Engineering, Inc., Los Angeles, Calif., for the past 20 years, died on April 10. A graduate of the University of Kansas, Lawrence, Kan., Mr. Senseman had been with Combustion Engineering for 44 years, holding many of the firm's original patents in the fields of pulverizing and drying. He was well known in the rock products industries and was one of the nation's best sales engineers and an expert on dust control, fine grinding and general mill practice. He was a member of A.S.M.E., A.I.M.E., and the Engineers' Club of Los Angeles.

PHILIP H. JACOBY, retired superintendent at the White Haven, Penn., plant of the General Crushed Stone Co., Easton, Penn., died March 9 after a short illness. He was 76 years of age and retired 21 years ago after serving about 32 years with the company.

ALEC B. FOX, eastern sales manager for the Lehigh Portland Cement Co., Allentown, Penn., was one of the 22 persons killed in the TWA airliner crash near the Pittsburgh, Penn., airport on April 1. He was 49 years of age. A native of Bethlehem, Penn., and a graduate of the University of Pittsburgh, Mr. Fox joined Lehigh in 1937 as a salesman in the Pittsburgh

office. He was transferred to Washington, D. C., in 1946, and went to Allentown as eastern division sales manager in 1952.

ROY E. JULIAN, vice-president of the Jackson Pike Sand and Gravel Co., Columbus, Ohio, died April 28. He was 69 years of age. He became ill while in Florida and was a patient in a St. Petersburg hospital for a month before returning to Columbus on April 14.

ALLISON N. TRICE, retired secretary-treasurer of the Cumberland Portland Cement Co., Cowan, Tenn., died April 23 at his home in Nashville, Tenn. He was 91 years old. A resident of Nashville for 62 years, Mr. Trice attended Cumberland University, Lebanon, Tenn., and retired from Cumberland Portland Cement Co. in 1947.

BENJAMIN GEZON, partner in the Gezon-Battjes Gravel Co., Grand Rapids, Mich., died on April 18 in Anniston, Ala., in an automobile accident in which his wife was injured seriously. He was 76 years old.

EDWARD A. BOELKOW, president of the Wisconsin Rock Wool Co., in Milwaukee, Wis., died suddenly on April 8 at the age of 45. He was a member of the Master Builders' Association of Milwaukee.

T. J. PETERSON, founder and president since 1911 of Tamms Industries, Inc., formerly known as Tamms Silica Co., Chicago, Ill., died May 4. He was 82 years of age.

LOUIS F. NAPPI, president of the Empire Concrete Block Co., Trumbull, Conn., died March 27. He was 43 years of age.

HENRY N. SLOAN, superintendent at the LaSalle, Ill., plant of Alpha Portland Cement Co., Easton, Penn., died April 2 after a short illness. He was 34 years old.

ROY T. HAMMUM, plant superintendent of the Newark Sand and Gravel Co., Newark, Ohio, died March 28 following an illness of three years. He was 56 years old and had been superintendent for 25 years.

HARRY H. DIBBERT, operator of the Waukesha Sand and Gravel Co., Milwaukee, Wis., died suddenly on April 3 at the age of 57.

H. A. SPINDLER, founder and partner in the Spindler Concrete Pipe Co., Columbus, Texas, died March 29 at the age of 73.

ROBERT T. JARDINE, superintendent of the Bennett Concrete Stone Co., Cleveland, Ohio, died March 12. He was 69 years of age and had been superintendent for 33 years.

# Du Pont Blasting Team increases fragmentation with maximum safety



**1. Face** in Keystone Portland Cement Company quarry at Bath, Pa., is ready for loading. 6,900 pounds of Du Pont Blasting Agents will be shot in nine 78' holes.



**2. Powerful load** of "Nitramex" No. 2 is lowered to bottom where extra strength and density are needed. Safety is increased . . . only a special primer can detonate it.



**3. Free-running Pelletol** No. 1 sinks rapidly around primary charge, giving maximum energy at bottom. Unlimited water resistance permits use in wet holes.



**4. "Nitramite,"** new medium-density Du Pont blasting agent, is used as top load because of its spreading action and low cost. It loads easily, shoots effectively in all materials.



**5. MS Connectors** (MS-17) are used to increase fragmentation . . . reduce vibration . . . prevent backbreak. Blasting is safer—no caps are needed until ready to shoot.



**6. 28,000 tons** of well-broken cement rock result from blast—a typical example of what a Du Pont Blasting Team can do for your operations.

**FOR FURTHER INFORMATION** on how Du Pont Blasting Agents will give you safer, lower-cost blasting, contact the Du Pont representative in your district, or write E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

## DU PONT BLASTING AGENTS

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**NEW, MULTI-PURPOSE MARFAK** — For those who want a multi-purpose lubricant, *Texaco Marfak Heavy Duty Special 2* is the new lithium-base grease that can be used for chassis, wheel bearings, water pumps and other bearing lubrication.

## World's best protection against wear and rust

**TEXACO MARFAK** is the name. This famous chassis lubricant clings to metal and seals the working grease within the bearing. Heavy loads won't squeeze it out, rough roads won't jolt it out. Its persistent lubricating film fights wear and prevents rust. Parts last longer, maintenance costs come down.

For wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in—assuring safer braking and extra thousands of miles between repackings. No seasonal change required.

For crawler mechanisms, use *Texaco Track Roll Lubricant*. It protects against wear and rust, prolongs roll life. For transmissions and differentials, use *Texaco Universal Gear Lubricant EP*—assure smoother performance, lower maintenance costs.

Let a Texaco Lubrication Engineer help you keep work on schedule through effective lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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# INDUSTRY NEWS

## Cover Picture

ON THIS MONTH'S COVER is shown an important section of the Becker County Sand & Gravel Co. plant at



Lillington, N. C. This 325 t.p.h. plant is processing a very high grade product from a deposit containing a large percentage of clay and silt. By the use of extensive washing facilities, including scrubber rotary screens, sprays over vibrating screens, sand screws, and liquid cyclones, a very clean product is produced. Due to the swampy character of the deposit area, a large walking dragline is employed for excavation. Haulage to the plant is by means of diesel-electric locomotive and railway cars.

## Start Fuller's Earth Operation

WAVERLY PETROLEUM PRODUCTS Co., Philadelphia, Penn., has begun operations on a 3000-acre site in Quality, Ga. to mine and process fuller's earth for oil and grease absorbents. The plant, costing more than a quarter million dollars, was built for expansion when necessary. All materials handling operations are mechanized, and bin samples of the raw earth are laboratory tested for proper volume, weight, hardness, color and absorption. Dust collecting equipment is installed at critical points throughout the plant, providing a finished granular product which is described as being completely free of dust. Provision has been made for calcining at both high

and medium temperatures, and the kiln is gas-fired with automatic controls to assure uniformity in the final product. Stand-by oil burning equipment has also been provided for emergencies.

The plant has a 13-car railroad siding, and space has been designated for a second railroad siding when it is needed. Two large truck loading docks are also located alongside the main storage area. The Waverly company has warehouse stocks of oil and grease absorbents in 62 cities and more than 1000 distributors throughout the country. Edward P. Frankel is president and Edward W. Coogan is sales manager. William R. Harris, Jr., Thomasville, Ga., was appointed plant manager of the Quality, Ga., fuller's earth operation.

## Expands Gypsum Capacity

KAISER GYPSUM Co., INC., Oakland, Calif., has increased the capacity of its plaster and gypsum wallboard plant at Long Beach, Calif., by about 60 percent and a cost of \$3,000,000. The expansion, started about a year ago, increased annual capacity of the plant to 210,000,000 sq. ft. of gypsum board and lath and 50,000 tons of plaster. The project is part of an overall program to be completed in November, which will boost the company's entire manufacturing capacity by 80 percent. Other plants are located in Antioch, Calif., and Seattle, Wash.

## Doubles Production

SOUTHERN PACIFIC MILLING Co. is nearing completion of its sand and gravel plant at Sisquoc, east of Santa Maria, Calif. The plant, costing about \$500,000, will double the present production capacity of the company in the Central Coast area. The plant will

utilize heavy media separation, to remove a "chalk rock" from the raw material. Cook Brothers Equipment Co., Los Angeles, Calif., is designing and supplying equipment for the plant.

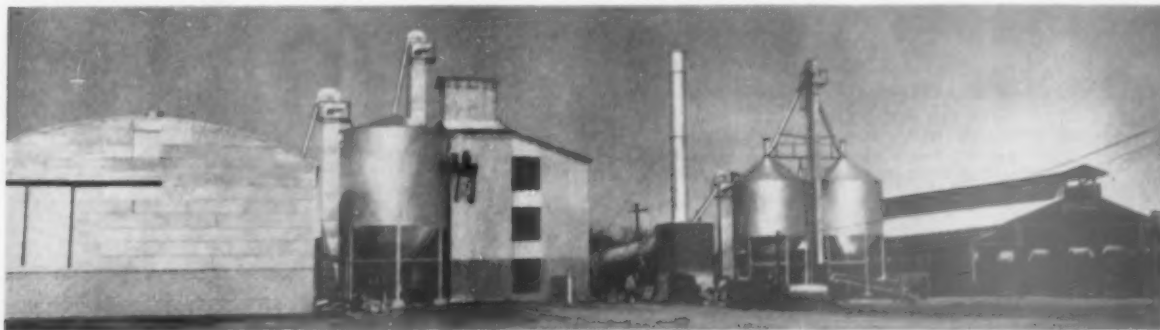
## Enlarges Limestone Operation

THE BETHLEHEM STEEL Co., owners and operators of limestone quarries north of Hanover, Penn., have started an enlargement program at the plant which is expected to cost several million dollars upon its completion in several years. Development of a new source of blast furnace limestone is underway, with full production by a processing plant to be completed within four or five years, according to Harry W. Campbell, Hanover plant superintendent. A quarry, located on a 1000-acre tract of land in Adams County, Penn., and comprising about 10 farms, was purchased by the company during the past two years, and is expected to handle the entire production demand when supplies are exhausted at the currently operated quarries. Almost all of the production at the Hanover quarries is sent to the company's Sparrows Point, Md., steel plant.

## Mexican Cement Plant Asks Aid

A MEXICAN CEMENT COMPANY, Techo Eterno Eureka, has requested the assistance of United States contractors for technical studies, design and construction of a cement plant in the state of Sinaloa. The studies would involve determination of the best site for the plant, which would have a proposed capacity of 1750 to 3000 bbl. The firm also requires a loan for purchase of machinery and for construction costs.

(Continued on page 41)



Fuller's earth plant at Quality, Ga., built by Waverly Petroleum Products Co., for processing oil and grease absorbents

# *Foote Mineral grinds*



LINED WITH LORAIN

**LINED WITH LORAIN.** This Marcy rod mill had ground 65,000 tons of spodumene ore when picture was taken. Notice snug fit of the Lorain Rolled Steel Plate Linings. Lift has been retained.

**THIS 5' x 12' MARCY ROD MILL** wet-grinds spodumene, an ore so hard that a particle of it will scratch glass! The size of the ore input is  $\frac{1}{4}$ " x 35 mesh. Output is 20 mesh, or no particle larger than .018-inch diameter. The mill is lined with USS Lorain Rolled Steel Plate Linings.



# *hard spodumene ore...*

## **with USS Lorain Rolled Plate Linings**

Spodumene makes for tough grinding. In fact, a small particle of it is sharp enough to scratch glass—a feat usually reserved for diamonds. Spodumene-bearing pegmatite is a source of lithium, an element used in the manufacture of glass, ceramics, and greases. This hard ore can—and has—played hob with grinding-mill linings.

When Foote Mineral Company, King's Mt., N. C., put two 5' x 12' Marcy rod mills to work wet-grinding spodumene in 1953, USS Lorain Rolled Steel Plate Linings were used in one of the two mills. After ten months, the Lorain Linings had ground a record tonnage of spodumene and lasted 33% longer than the linings in the other rod mill.

An engineer at Foote Mineral Co. said: "Lorain liner costs have averaged substantially less per ton of ore ground than our former liners. We are particularly

pleased with Lorain Liners in that, after installation, we experienced no liner shifting or bolt breakage."

USS Lorain Plate Linings give this kind of performance because the steel is rolled to specifications that result in toughness, which allows the liner plates to wear paper-thin without failure. The lift bars are rolled from alloy steel for extra hardness that maintains lift and grinding efficiency for the life of the lining. Because Lorain Linings are tougher, thinner linings can be used—thus increasing mill capacities.

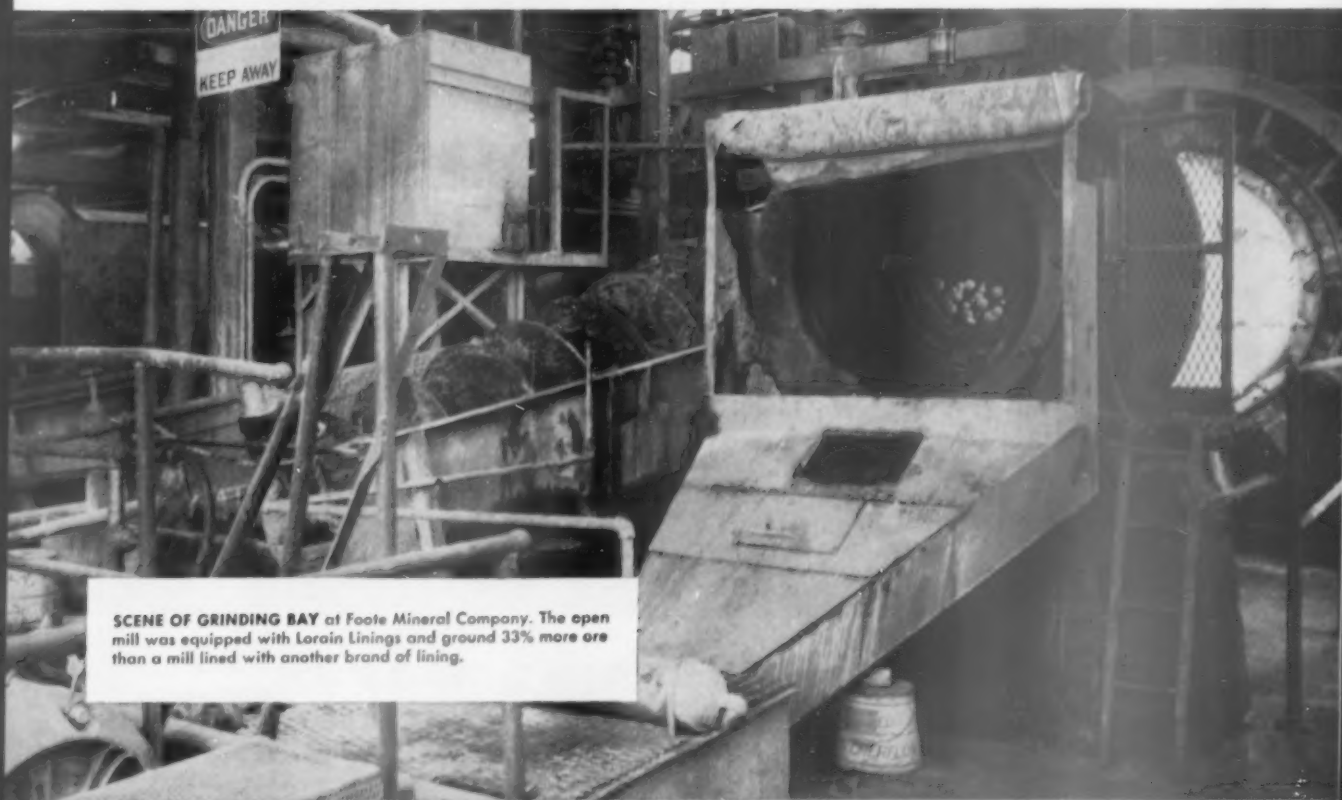
For close tolerances and snug fit, for long-lasting linings that mean lower-cost grinding, always specify USS Lorain Rolled Plate Linings. A note to Specialty Products Sales, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa., will bring experienced engineering assistance on any grinding problem.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

## **USS LORAIN ROLLED PLATE LININGS and USS GRINDING BALLS**



6-1065



SCENE OF GRINDING BAY at Foote Mineral Company. The open mill was equipped with Lorain Linings and ground 33% more ore than a mill lined with another brand of lining.

UNITED STATES STEEL

# as modern as they come...

DESIGNED AND EQUIPPED BY

# TELSMITH



**Crushing Plant** (above)—Plus 4" gravel goes to a 18" x 32" TelSmith Jaw; plus 1½" gravel to a 36-S Gyrasphere Crusher; the scalper is a 4' x 12' TelSmith 2-deck Vibro-King. **Washing Plant** (right) has a 72" TelSmith Super-Scrubber; two 4' x 12' TelSmith 2-deck Vibro-King rinsing-sizing screens; 24" x 20' TelSmith Twin Screw Sand Classifier.

**New Plant of L. Romano Construction Co., East Providence, Rhode Island,** processes 200 tons per hour of washed aggregate—sand, and 3 sizes of gravel all under 1½" and stockpiled. TelSmith designed the plant, and built the machinery. Send for TelSmith Complete Plant Service Bulletin 278.



#### Many Features of Modern Design—

In this plant both TelSmith Crushers are high capacity, low maintenance machines. The large-capacity TelSmith sizing screens have spray bars on every deck. The extra heavy-duty TelSmith Super-Scrubber takes out the clay as well as soft stone, assuring top quality aggregate always. Send for TelSmith Bulletin 266.

## SMITH ENGINEERING WORKS

508 E. CAPITOL DRIVE

Representatives in Principal Cities in All Parts of the World

MILWAUKEE 1, WISCONSIN

Cable Address: Sengworks, Milwaukee

which would be guaranteed by the plant itself. Details of the proposal may be obtained upon request from Sr. Don Manuel Suarez y Suarez, president, Techo Eterno Eureka, Avenue Becerra 264, San Pedro de los Pinos, Mexico, D. F.

### Kaiser Aluminum TV Show

KAISER ALUMINUM & CHEMICAL CORP., Oakland, Calif., is sponsoring a live dramatic show, beginning July 3, on alternate Tuesday evenings from 9:30 to 10:30 (EST) over a National Broadcasting Company nationwide network of 115 television stations. The company will make its TV hour a showcase for aluminum products manufactured by its customers and will demonstrate new developments in aluminum to serve both industry and the consumer. The company also plans to use the show to further establish public recognition of its growing leadership role in the aluminum industry, as well as to promote its own line of products for consumer use.

This initial use of network television as an advertising medium by Kaiser Aluminum is in addition to continuing heavy schedules in newspapers, magazines, trade publications and radio.

### Air Lift for Core Drill

WORKING AT A 7000 FT. ELEVATION in 20 deg. below zero weather is a problem in itself, but to reach such an elevation, especially when the objective is located in the Rocky Mountains on the top of a canyon wall with sheer 1500-ft. cliffs, is a still more difficult project. This is what faced the Atlas Corp. of Lancaster, Penn., in order to test drill for uranium in the Hidden Splendor, Utah, area.

An air compressor was needed to supply air to several drill rigs doing

the test drilling. In order to bring the unit up, the Le Roi 105 air compressor was dismantled, flown by helicopter to the top piece by piece, and then reassembled. The drilling, at times, was a half-mile from the compressor, adding another burden to its operation. But sufficient air supplies were furnished, and the corporation obtained its test cores.

### Plans Crushed Stone Plant

NATIONAL LIME AND STONE CO., Findlay, Ohio, is building a crushed stone plant at Buckland, which will be the ninth plant operated by the company. Paul Palmer, president of the company, announced the purchase of 63 acres of land from William Ziegenbush, about 17 acres from Edgar Mertz, and a one-half acre tract for railroad right-of-way from Irene Easley. A plant north of Buckland, owned by the firm, will continue operations until the new plant is completed.

### Lithium Operations

THE BASIC ATOMICS COMPANY is building a pilot-plant at Lincoln County, N. C., for the extraction of lithium from spodumene ore. Foote Mineral Co. began processing at a plant near Kings Mountain, N. C., in 1951, and Lithium Corporation of America began operations at a lithium processing plant, costing about \$7,000,000, at Bessemer City, N. C., in early 1955.

### Wants Power Plant

ISFAHAN CEMENT CO., LTD., Khia-bane-Hezar Jerib, Isfahan, Iran, plans to purchase a complete power plant, either diesel or turbine, according to the following specifications: Three diesel-generator sets having an output of 800-1000 kw. each, with distribution panels, 6300-volts, 3 phases, 50 cycles;

or two turbine-generator sets having an output of 1250-1500 kw. each, with distribution panels, 6300 volts, 3 phases, 50 cycles.

A World Trade Directory report is available on this company from the Commercial Intelligence Division, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., at a cost of \$1. Interested suppliers should quote direct to the Isfahan Cement Co.

### Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 21,440,000 bbl. of finished portland cement during January, 1956, as reported by the Bureau of Mines. This was an increase of 6 percent over January, 1955. Mill shipments in January, 1956, totaled 13,273,000 bbl., a decrease of 0.3 percent compared with January, 1955, while stocks on hand for January, 1956, were 9 percent more than on the same date last year. Clinker production during January, 1956, totaled 25,153,000 bbl., an increase of 10 percent over the January, 1955, figure. The output of finished cement during January, 1956, came from 158 plants in 37 states and Puerto Rico. During the same period of 1955, 20,223,000 bbl. of finished cement were produced.

### Arc Welding Competition

THE JAMES F. LINCOLN ARC WELDING FOUNDATION, Cleveland, Ohio, is sponsoring a competition for ideas to accelerate progress in arc welding, which opened January 1, and closes July 30, 1956. Suggestions that may be submitted must answer the question of how the progress of arc welding may be accelerated through advances in the knowledge of design, engineering and application for the arc welding process. The following awards will be made: first award, \$5000; second award, \$4000; third award, \$3000; fourth award, \$2000; and fifth award, \$1000. Five additional awards of \$500 each will be given, and ten awards of \$250 each. For details concerning the competition, write to: The James F. Lincoln Arc Welding Foundation, P. O. Box 3035, Cleveland 17, Ohio.

### Seek Continued Mineral Aid

CONGRESS is being asked to enact legislation aimed at increasing domestic production of seven critical and strategic minerals, among them, manganese, mica and asbestos. Bills planned or introduced would stimulate production of these minerals, continuing the federal government's purchase-stockpile program for defense minerals for another three years. An omnibus bill covering the minerals has been pro-

(Continued on page 45)



Portable air compressor was flown piece by piece, using a helicopter, to a Rocky Mountain site for uranium test core drilling operations of Atlas Corp., Lancaster, Penn.

Because it's lighter...  
the new TDA® lightweight tandem  
gives you...

**MORE  
PAYLOAD  
HERE!**



▶ **this means...**

# 8,500 EXTRA TON-MILES PAYLOAD A YEAR

...and it's built with a high percentage of parts interchangeable with Timken-Detroit® standard single axle components

There are important payload bonuses for truckers in TDA's new lightweight tandem. Over 230 pounds lighter than any unit of the same capacity, this new axle assembly gives operators more than 8500 extra ton-miles of payload during an average 75,000-mile trucking year.

Important maintenance advantages also are gained with this new tandem. Almost all of the wearing parts — gears, pinions, differentials, bearings and brakes — are identical with components from widely used TDA standard single axles. This means easier service, smaller parts inventory, and more time on the road.



## Some Outstanding Features of this New Timken® Tandem

**TDA Inter-Axle Differential** divides torque evenly between axles . . . yet permits wheels of one axle to revolve faster or slower than wheels of the other axle. This means both axles are doing equal amounts of work . . . driving parts and tires last longer.

**Driver-Controlled Lockout** — with TDA Inter-Axle Differential, the driver can obtain the advantages of straight-through drive under slick or icy conditions by locking out the differential at any driving speed.

**Big, Dependable Hypoid Gears** rotate in conventional direction for maximum gear and bearing life.

**Optional Axle Connecting Groups.** This new tandem is available with either TDA famous "Cradle Ride" axle connecting parts, or brackets to accept other approved chassis hook-ups.

This new tandem insures new payload profits, faster, easier service and operating economies for operators everywhere. For complete information contact your nearest vehicle dealer or branch.



**WORLD'S LARGEST MANUFACTURER OF AXLES  
FOR TRUCKS, BUSES AND TRAILERS**

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Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

**ALLIS-CHALMERS**  
**Rotary**  
**COMPRESSORS**



**HOW RO-FLO**  
**UNITS OPERATE**

Centrifugal force moves blades to outside wall to form air chamber.

**You get**  
**MORE**  
**ADVANTAGES**

**with RO-FLO units for shop air, drilling, gas handling**

**TYPE and SIZE for EVERY NEED**

Both single and two-stage *Ro-Flo* compressors are available. Single-stage units for pressures to 50 pounds gauge, and volumes from 42 to 3245 cfm.

Two-stage units in twelve sizes for 250 to 1800 cfm at pressures from 60 to 125 pounds gauge.

Single and two-stage *Ro-Flo* vacuum pumps for vacuums to 0.3 inch mercury absolute, from 22 to 5950 cfm.

Call your nearest A-C office or write for bulletins 16B8244 (two stage) and 16B8126 (single stage). Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

- 1** **CONSTANT EFFICIENCY** — During operation the sliding vanes of the rotor press against the cylinder wall to form air cells. Even if these vanes wear, the rotating force holds them in contact with the cylinder wall so that efficiency and air flow never change.
- 2** **LOW-COST FOUNDATIONS** — Smooth rotation cuts vibration. This eliminates need for heavy foundations used with reciprocating-type units. Small units can be bolted directly to the floor. Large units need only a simple slab.
- 3** **COMPACTNESS** — No extra weight or extra size is needed to dampen vibration. Every inch is devoted to air or gas handling.
- 4** **LOW MAINTENANCE** — There is no wear and tear from shock and vibration . . . no pistons and valves.

*Ro-Flo* is an Allis-Chalmers trademark.



A-5028

**ALLIS-CHALMERS**

posed by Senator Murray (D.-Mont.), which would, among other things, provide payment of bonuses to domestic producers if and when the purchase program ends. Representative Jonas (R.-N.C.), regarding the stimulation of discovery and promotion of domestic mica, stated: "High-quality mica is the only known material satisfactory for use in essential electronic products, of which we have increased need in defense as well as civilian activities."

### **Permanente Expansion Program**

PERMANENTE CEMENT CO., Oakland, Calif., has reported net earnings of \$6,288,000 for 1955, the highest in the company's history. A summary of its current expansion program, costing about \$35,000,000, which will increase the overall cement and gypsum production capacity by more than 60 percent also was outlined.

Upon completion of the expansion program, the company will have an annual capacity of 11,000,000 bbl. of cement, or about 20 percent of the cement production capacity in the Pacific Coast states and British Columbia. Kaiser Gypsum Co., Inc., a wholly-owned subsidiary, will have an annual capacity of over 600,000,000 sq. ft. of gypsum board products and 85,000 tons of plaster; approximately 30 percent of the plaster, lath and wall-board capacity in the seven western states.

The cement plant being built in Lucerne Valley, San Bernardino County Calif., will have an annual capacity of 2,500,000 bbl. upon completion in the fall of 1956. This is an increase of 500,000 bbl. over the originally planned capacity, and will account for about 10 percent of cement produced in that area. The Cushenbury limestone deposit, on which the plant is located, is about 30 miles south of Victorville, Calif. The plant site and surrounding area comprise 220 acres, and in addition to quarrying limestone for the cement operation, Permanente has contracted to mine and crush Kaiser Steel's requirements of metallurgical-grade limestone. The deposit is estimated to contain sufficient reserves for maximum anticipated requirements for both Permanente and Kaiser Steel in excess of 50 years.

A sixth kiln is being added to the Permanente cement plant near Los Altos, Calif., along with expansion of the dust collecting system, additional clinker and bulk cement storage, increased raw and finish grinding capacity and major electrical equipment, which is expected to cost a total of \$4,400,000.

The second unit of the recently built gypsum products plant at Antioch,

Calif., will go into production this fall. Combined annual capacities of the two plants, the first unit opened in February, 1956, will be 274,000,000 sq. ft. of gypsum board products and 20,000 tons of plaster.

A 60 percent expansion of the Long Beach, Calif., gypsum products plant was recently completed at a cost of over \$3,000,000, with an annual capacity of 210,000,000 sq. ft. of gypsum board products and 50,000 tons of plaster.

Other phases of the program include expansion of raw material sources in Mexico, additional rolling stock, Southern California distribution facilities and the construction of a 17,000-ton capacity ore ship. The latter, a specially designed, self-unloading ore carrier, costing \$4,200,000, will join the SS Harry Lundberg in supplying gypsum ore to plants at Long Beach and Antioch, Calif., and Seattle, Wash. Including the two bulk cement ships, SS Permanente Silverbow and SS Permanente Cement, this will increase the company's fleet of cement and gypsum ore carriers to four.

### **Converts Depleted Quarry**

LARSON BROS. SAND AND GRAVEL CO., Rockford, Ill., is converting 15 acres of depleted sand and gravel quarry land into a man-made lake and beach. The beach, to be opened in the middle of June, will provide facilities for about 4000 bathers, and will be the first of its kind in the Rockford-Loves Park, Ill., area. The sand and gravel excavation is being enlarged for the lake, which will be known as "Windsor Lake." Features will include a wading area for small children, high and low diving areas, a section where corrugated glass canopies for shading will be installed along a concrete spillway through which water will be pumped, a large parking area, concessions stands, and locker and shower room facilities.

### **Cement Company Expands**

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, in the midst of an expansion program which has already increased capacity to 9,000,000 bbl. of cement annually from 8,000,000 bbl. at the end of 1955, plans to further increase its cement production to 12,300,000 bbl. annually by the end of 1957, according to Ellery Sedgwick, Jr., president. The cost of expansion was placed at about \$30,000,000, with \$5,000,000 spent during 1955, \$14,000,000 to be spent in 1956, and \$11,000,000 to be spent during 1957.

Mr. Sedgwick estimated the cement industry as a whole will increase its capacity from 294,000,000 bbl. annually at the end of 1954 to 381,000,-

000 bbl. annually by late 1957. When the added capacity comes into production, he believes the industry may operate at only 85 percent to 90 percent of capacity for a while, but he feels the federal and state highway programs and building needs will consume the slack rapidly.

### **Expands Gypsum Operations**

CELOTEX CORP., Chicago, Ill., has announced plans for a gypsum board and plaster plant at Fort Dodge, Iowa, costing about \$6,000,000. The company owns 480 acres of land at Fort Dodge, and has mineral rights on additional gypsum property near its present plant. The new plant and its adjoining area will require at least 30 acres of land, according to the company, and is scheduled for completion by the end of 1957. The plant is part of the company's \$22,000,000 expansion program currently in progress.

### **Honor Retired Employees**

THE RIVERSIDE CEMENT CO., Riverside, Calif., and Local 48 of the United Cement, Lime & Gypsum Workers International Union, sponsored a dinner recently, honoring employees of the cement company who retired during 1955. These were E. B. Ribelin, Jose Vasquez, R. F. Jack, William Purvis, C. A. Lynde and Edward Matson, who were each presented with a wrist watch.

### **Doubles Roadstone Output**

M. G. SNYDER & SONS, INC., Dayton, Ohio, has more than doubled production with the installation of a portable crushing plant. The company formerly produced 140 tons of road stabilizer, a combination of sand and gravel, per hour, and will produce an additional 200 t.p.h. with the recently installed crushing plant.

### **Rezoning Denied**

CENTURY ROCK PRODUCTS CO., Pasadena, Calif., was recently denied rezoning of 100 acres of agricultural land for quarry purposes. It was claimed that establishment of a quarry would devalue homes in the area, and present a noise and dust hazard. A noise and traffic hazard to school children in the area was also claimed in the zoning hearings.

### **Increases Cement Capacity**

CALIFORNIA PORTLAND CEMENT CO., Los Angeles, Calif., is expanding the facilities at its Mojave cement plant in Creal, Calif., increasing the capacity to over 5,500,000 bbl. annually. This will be an increase of 3,500,000 bbl., according to Ernest E. Duque, president, resulting from the addition

(Continued on page 49)

Completed in 1954, this Research-Cottrell precipitator cleans the gases from Kiln No. 5 of Missouri Portland's Prospect Hill Plant. The gases from this rotary wet process kiln pass from the kiln end housing, through the precipitator, induced draft fan and then up the stack.

Rapping puffs were eliminated in this installation with Research-Cottrell's electronically controlled M. I. Rappers. This method of continuous, sequential rapping avoids dust re-entrainment in the gas stream and assures optimum precipitator performance at all times.

# **Research-Cottrell Precipitator** *at Missouri Portland*

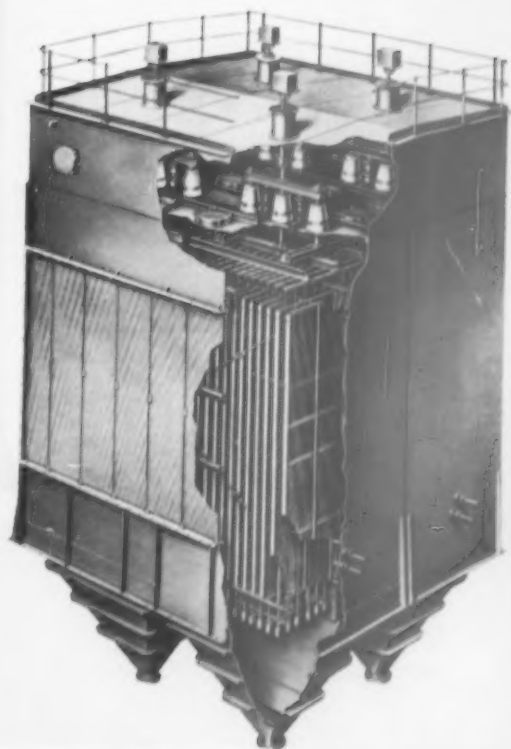
In addition to this installation, Missouri Portland has ordered three more Research-Cottrell precipitators. One, installed early this year, cleans the gases from Prospect Hill's 12' x 450' wet process kiln.

Two other units have been ordered for two dry process kilns at the Sugar Creek Plant, Kansas City, Mo. M. I. Rappers will be included on all these installations.

For a detailed description of Research-Cottrell precipitators and their applications in the cement industry, write for Bulletin GB.



At Left:  
Shows Research-Cottrell  
precipitator, connecting  
flues and stack, Cement  
block building in foreground  
at right is substation which  
contains two half-wave  
rectifier sets and A. L.  
Rapper control equipment.



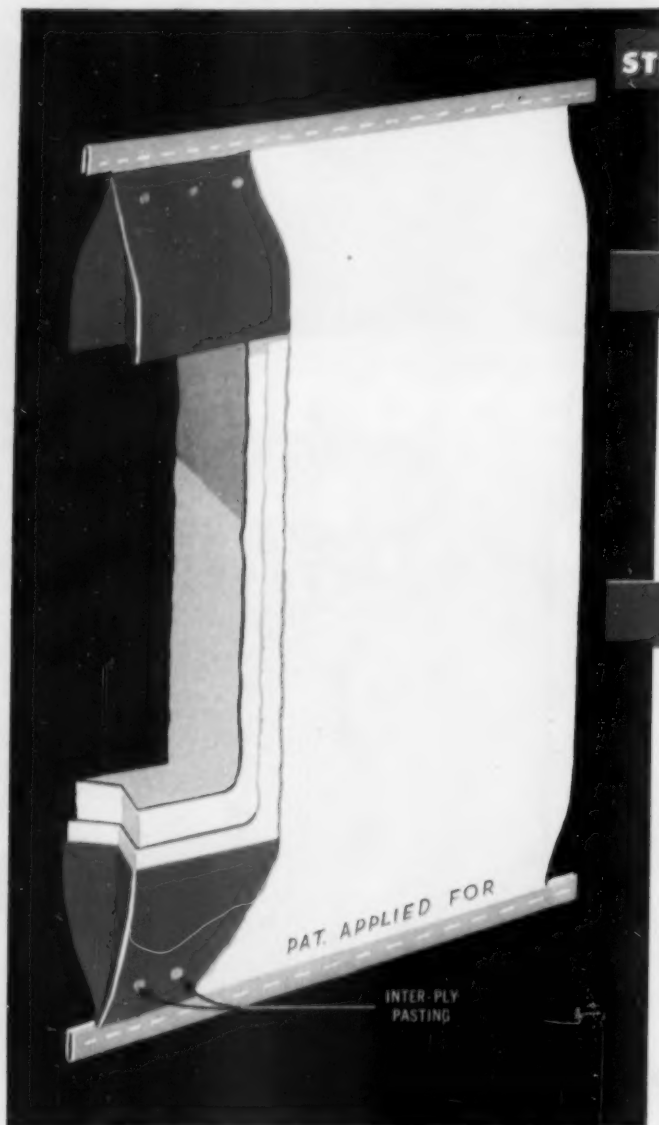
At Right:  
Cutaway drawing of the  
Research-Cottrell expanded  
metal plate precipitator  
installed at Prospect Hill  
Plant of Missouri Portland  
Cement Co.

# Research-Cottrell, Inc.

Main Office and Plant: Bound Brook, New Jersey • 405 Lexington Ave., New York 17, N. Y.  
Grant Building, Pittsburgh 19, Penna., 228 No. La Salle St., Chicago 7, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

# New *Strength-end* \* Bemis Multiwalls

the shipping sack with **BALANCED STRENGTH**



## STRONGER AT THE RIGHT PLACES

New Bemis Strength-End Multiwalls, strengthened top and bottom where most sewn bag breakage is experienced, will cut packing troubles and costs for you.

## TWO WAYS TO SAVE

You'll save money one of these two ways with Bemis Strength-End Multiwalls: You may switch from a more expensive type of shipping container. Or, if you are already using multiwalls, you might use bags with fewer plies, because of the greater end strength, where it is needed. Bemis Strength-End Multiwalls may, at lower cost, do your job as well or better.

## SUCCESSFULLY TESTED

Bemis Strength-End Multiwalls have been successfully tested in all sections of the country and under all climatic conditions. They have proved themselves for packing cement, fertilizer, chemicals, flour, salt.

## Here's how it's reinforced

The reinforcement in Bemis Strength-End Multiwalls is a strip of sturdy kraft, several inches wide, running horizontally around the bag at the ends... anchored to the other walls so it works in conjunction with them... and adding greatly to the strength both at the sewing line and at the gusset corners. It's just plain, common-sense, balanced strength construction.

\*TRADE-MARK

Get the complete story about Bemis Strength-End Multiwalls from your Bemis Man.

# Bemis



General Offices—St. Louis 2, Mo.  
Sales Offices in Principal Cities

of three kilns to be installed. The project is scheduled for completion during the last half of 1957.

### Possible Cement Shortage

CONCERN OVER CEMENT SUPPLIES was voiced at a recent board meeting of the National Association of Home Builders. While home building is increasing, the association reported that builders are "a little concerned about supplies of cement and glass for picture windows." Other materials are expected to be in adequate supply during the year. Despite an estimated output of 200,000,000 bbl. of cement during 1956, the government has warned that "local shortage will still occur" because construction contracts may reach a record-breaking total of \$44 billion in 1956. The increase includes a 12 percent rise in spending for highway construction, and enactment of President Eisenhower's multi-billion dollar highway program may also intensify the problem unless cement output is increased further, according to the association.

### Gypsum Company Expands

NATIONAL GYPSUM CO., Buffalo, N. Y., has announced plans for expansion and modernization, which will include a gypsum quarry located between the present gypsum products plant at National City, Mich., and Lake Huron, an aerial tramway extending more than a mile into Lake Huron, and the purchase or taking of options on acreage in Iosco County, Mich. The aerial tramway will have a vertical clearance of 30 ft., and will have mooring facilities at the outer end of the 6000-ft. extension into Lake Huron. The expansion program, costing about \$95,000,000, also includes new plants being built in Louisiana and New Jersey.

### Offers Three Limestone Sizes

WEST HILL COAL & LIMESTONE CO., Akron, Ohio, is now producing three sizes of limestone, a standard "driveway" size, pea-size, and a heavy size for road bases. A large tipple in the company's yard is filled directly from the railroad cars, and trucks are loaded by gravity, reducing handling costs.

### Iowa Cement Production

IOWA'S CEMENT INDUSTRY produced 10,118,000 bbl. of cement during the 12 months ended December, 1955, according to a survey published by the Bureau of Mines. This is a 52 percent increase over the production of 6,655,208 bbl. in 1949, when Iowa ranked 11th in the nation in the production of finished portland cement. The state now ranks eighth in the nation.

### Trace Elements and Potash in Illinois Gravel

AN INVESTIGATION has been conducted by the Industrial Minerals Division of the Illinois State Geological Survey to determine whether some Illinois gravels might be used as a combined fertilizer and agricultural limestone. This would provide an outlet for some gravels or for certain sizes of gravel which are unavoidably produced in some quarrying operations, in quantities exceeding their demand.

The studies showed that some Illinois gravels contain appreciable amounts of potash, as well as significant trace elements of boron, copper, manganese, and possibly others. It is believed that those gravels containing the largest percentage of light-colored igneous rock pebbles, such as granite and syenite, will be higher in potash and, conversely, that the high limestone and dolomite gravels will be relatively low in potash. Whether a pulverized gravel may have significance as a combined liming and fertilizing material in any given area depends upon a great many factors which are beyond the scope of the Survey's study. The needs of different soils, the rate of availability of the potash and trace elements in the gravel, and the economics of pulverizing gravel for agricultural use are factors which must be considered.

The Survey also reports that 1955 was the most productive year on record with the production values of industrial minerals increasing approximately 6 percent over values for 1954. Fluorspar and metals, which had fallen off in value to less than \$10,000,000 in 1954, are again in demand with their value increased to \$11,500,000 in 1955, according to the Survey. Fluorspar is still subject to competition from foreign mines, but an increased demand from manufacturers of hydrofluoric acid and from the steel industry has resulted in reopening production at a number of Illinois fluorspar mines.

### Cement Plant Operating

INLAND CEMENT CO., LTD., Montreal, Que., Canada, is in full production at its cement plant at Edmonton, with a capacity of 900,000 bbl., annually, compared with the originally planned 800,000 bbl. capacity. It had previously been announced that the capacity will be doubled to 1,800,000 bbl., beginning in the Spring of 1957.

### Increase Gypsum Output

UNITED STATES GYPSUM CO., Chicago, Ill., is expanding its plant in Lisbon Falls, Mass., increasing production by about 40 percent. The

company produces gypsum insulation board, tile, planks, building board and sheathing.

### Canadian Cement Subsidiary

LAFARGE CEMENT OF NORTH AMERICA LTD. has been established in Vancouver, Canada, as a subsidiary of the Societe Anonyme des Chaux et Ciments de Lafarge et du Teil, Paris, France. The subsidiary company has acquired a 50-acre site at Lulu Island, and plans to build a cement plant there costing about \$13,000,000.

### Builds Lime Plant Laboratory

MARBLEHEAD LIME CO., Chicago, Ill., has built a chemical laboratory building and an office building at its plant in Thornton, Ill. The laboratory contains modern chemical equipment for analytical analysis and physical testing for quality control of the company's lime products.

### Increases Cement Storage

VOLUNTEER PORTLAND CEMENT CO., Knoxville, Tenn., has increased its cement storage capacity by 80 percent, in order to provide for such emergencies as the recent cement shortage. The company shipped 2,100,000 bbl. of cement during 1955, and expects to ship 100,000 bbl. more during 1956.

### Buys Gravel-Rich Land

THE HENRY J. KAISER CO., Oakland, Calif., has purchased a 565-acre ranch in Alameda County, Calif., from Anna Stivers, for a reported \$2,000,000. The land is reported to have a rich gravel deposit.

### Opens Harbor for Shipping

INLAND LIME & STONE CO., Manistique, Mich., has opened the Port Inland harbor to begin shipment of a stockpile of about 50,000 tons of metallurgical limestone produced during the winter.

### Asbestos Consumption

ASBESTOS CONSUMPTION in the United States during 1954 decreased 13 percent from the all-time high of 1953, as reported by the Bureau of Mines. During 1954, 45,813 short tons of domestic asbestos were produced, compared to 57,950 short tons produced in 1953.

### Cement Company Organized

THE MISSISSIPPI VALLEY PORTLAND CEMENT CO., Vicksburg, Miss., was recently incorporated, and has announced plans to build a cement plant north of Vicksburg, on the Yazoo River, costing about \$3,000,000, according to Robert W. Hyde, Jr., recently elected president. Construction

(Continued on page 53)

# *Here's the New* **R-15 "Euc"**

**that sets a new high in 15-ton  
Rear-Dump Performance!**



#### **DUMPS FAST AND CLEAN**

Smooth body interior and tapered rear chute assures clean shedding of the load well back of the rear wheels—an important feature for dumping into hoppers or over the edge of waste banks. Lycoming Silica Sand Co. in Pennsylvania has used 15-ton "Eucs" for years and now has added two R-15 Rear-Dumps to their hauling fleet.



#### **STAY ON THE JOB LONGER**

Victorville Lime Rock Co. in California uses 2 Model R-15 "Eucs" for hauling rock and overburden. Rugged body and frame withstand the impacts of loading, hauling and dumping heavy excavation in construction, mine and quarry service.

Built for heavy off-the-highway service, 15-ton Rear-Dump "Eucs" have paced the field for over 20 years. They've reduced hauling costs on hundreds of the toughest jobs in mine, quarry and construction work... delivered "plus" performance year in and year out.

This model R-15 incorporates the engineering advances, the easy operation and maintenance features, resulting from unequalled field experience with other Euclid Rear-Dumps of the same capacity. It provides the dependable work-ability that means more payloads per day at lowest cost per ton or yard moved.

Have your Euclid dealer give you full details on this new 15-ton Rear-Dump and the complete line of Euclid earth moving equipment. He'll be glad to show you why so many users have proved for themselves that *Euclids are your best investment.*

**EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio**  
**The R-15 is your BEST BET for Lower Hauling Costs!**

Advanced design results from 20 years of leadership in  
building off-highway  
Rear-Dumps



Some of the  
**OUTSTANDING  
FEATURES**  
of the R-15

- 10½ yd. body
- 30,000 lb. payload
- 218 h. p.
- loaded top speed of 25 m.p.h.
- hydraulic booster steering
- air assist clutch
- free floating springs
- 14.00 x 24 drive tires (16.00 x 25 optional)



**POSITIVE CONTROL OF DUMPING**

Double-acting 3 stage Euclid hoist and hydraulic system gives the operator fast, positive control of the body position at all times. Dumping angle of the body, in fully raised position, is 68°. Body, frame and hoist are designed and built as an integral unit. McDowell & McDowell are using six R-15 "Eucls" to haul heavy excavation at a big plant site job in Nashville, Tennessee.



**SPEED AND STABILITY**

The 5 speed transmission and Euclid planetary axle provide a top speed of 25 m.p.h. with full 15 ton payload... 27 m.p.h. with 16.00 x 25 tires. Free floating Euclid spring suspension gives maximum stability empty or loaded under all road conditions... permits faster safe travel speeds. Dale Bloom had a fleet of 6 Rear-Dump "Eucls" on this Kansas Turnpike job—2 of them the Model R-15.



**EASY OPERATION**

Full width cab offset to left for maximum vision, air assist clutch, booster steering, 218 h.p. engine, fast acting hoist, free floating springs and fully adjustable seat contribute to driver comfort and easy operation. Four of these new Rear-Dumps worked on a highway relocation job of W. J. Menefee Construction in Missouri.



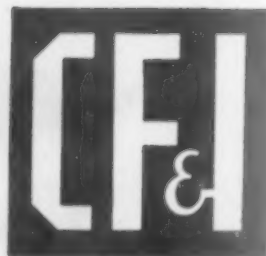
**Euclid Equipment**

FOR MOVING EARTH, ROCK, COAL AND ORE



# IN GRINDING MATERIALS

*your best buy is*



... AND HERE'S WHY: All grinding balls look alike, and cost pretty much the same. This holds true for grinding rods, too. This being the case, the best way to buy is on the reputation of the manufacturer and the performance record of his products.

CF&I, for example, has an established reputation as a leading manufacturer of quality products for use in the mining industry. Having grown up in close geographical proximity to the western mining industry, CF&I has gained unmatched "know-how" in the production of grinding materials. It is this "know-how," applied at every point in the manufacturing process from ore to finished product, that assures you of getting the best when you specify CF&I Grinding Balls or Rods ... whatever your grinding application.

As for product performance, CF&I Grinding Balls, forged from special analysis steel, have an ideal balance between toughness and hardness ... are well known for their optimum grinding ability and wearability. And CF&I Grinding Rods, also made from special analysis steel, machine straightened, and with square-cut ends, have an established reputation for efficiency and economy in grinding operations.

Whatever your grinding material needs, it will pay you to consider CF&I Grinding Balls and Grinding Rods. Contact your CF&I representative to discuss your requirements.



**THE COLORADO FUEL AND IRON CORPORATION**

3563

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston  
Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio  
San Francisco • Seattle • Spokane • Wichita • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Montreal • Toronto • Vancouver • Winnipeg

will be financed by 1,250,000 shares of the company's original capital stock at \$3 per share.

Executive officers of the company are: Robert W. Hyde, Jr., president; Cecil F. Travis, vice-president and director; James W. Sanders, treasurer; Fred Moran, director; Sam B. Reid, director; Robert L. Dent, director and general counsel; Calvin C. Huffman, secretary; David W. Adams, director, in charge of promotion and public relations; Carroll Low, director; Kent B. Diehl, Sr., director and general manager; and Allen Moore, director.

### Three-Year Safety Record

STANDARD LIME & CEMENT CO., Baltimore, Md., recently observed three consecutive years of safe operation at the Kimballton, Va., cement plant, at a dinner for the employees and guests. Working shifts around the clock and employing about 135 persons, the plant had no disabling nor lost-time injury from February 23, 1953 to February 23, 1956. W. E. Rapp, plant manager of Potomac River Works, E. I. du Pont de Nemours and Co., Martinsburg, W. Va., outlined fundamental principles of a successful safety program. G. C. Larkin is plant superintendent of the Kimballton plant.

### Pakistan Cement Plant

THE MAPLE LEAF CEMENT FACTORY, built by the Pakistan Industrial Development Corp., Dadukhel, with the financial assistance of Canada, has begun operations in Karachi, Pakistan. The plant has a capacity of 100,000 tons of cement annually, which is expected to be doubled in the near future. The development firm plans to build two more cement plants at Sukkur and Karachi, in order to make Pakistan self-sufficient in its requirements of cement. These plants are each expected to have a capacity of 150,000 tons annually.

### Improves Agstone

MARBLE CLIFF QUARRIES CO., Columbus, Ohio, has announced a change in the screen analysis of its "Evr-Sweet" kiln-dried ground agricultural limestone. The agstone is now offered in pulverized form, sold in bulk with no change in plant price. Based on 2000 lb. of ground limestone, only 1700 lb. of pulverized limestone is required to receive the amount of federal cost sharing allotted in each country.

### Vermiculite Institute Meets

VERMICULITE INSTITUTE OF CHICAGO held its 15th annual meeting March 24 through 29 at the San Marcos Hotel in Chandler, Ariz., with about 90 members and guests attending. An entire day was devoted to discussions on



H. W. Steiff

vermiculite concrete, with R. W. Sterrett, chairman of the concrete committee, reporting that the industry's concrete aggregate volume is growing rapidly due to the development of poured-in-place roof deck systems and precast vermiculite concrete roofing tile. Eugene L. Perrine, senior physicist of the institute's research laboratory, reported that several research centers have been testing hot water panels with and without an insulating slab of vermiculite concrete. The results indicate that continuous insulation with a vermiculite slab will reduce the size of the required heating plant by 20 percent, assure faster response by the heating system, and effect fuel savings of 10 percent over the life of the building, according to Mr. Perrine.

J. C. Spence, institute engineer, reported on a test demonstrating the adequacy of vermiculite concrete roof decks as horizontal diaphragms with a high safety factor in resisting earthquake loads. M. G. Quayle, Zonolite Co., Chicago, discussed a steel frame house construction with machine-applied vermiculite concrete walls. The use of vermiculite for roofing, growing, and shipping plants was reported on by H. A. Dresser, chairman of the agricultural committee.

Harvey W. Steiff, Minneapolis, Minn., vice-president of Western Mineral Products Co., was elected president of the institute, succeeding Dayton L. Prouty of Dearborn, Mich. J. Brooks Robinson of Great Falls, Mont., and J. A. Kelley of Travelers Rest, S. C., were elected to the board of directors.

### May Locate at Third Site

DRAGON CEMENT CO., New York, N. Y., rebuffed in previous efforts to locate a cement plant, costing about \$10,000,000, in West Stockbridge and

North Adams, Mass., is considering a third site between Washington and Hinsdale, Mass. The company has optioned 550 acres along the Boston & Albany railroad tracks for possible location of the proposed cement plant. Hinsdale has been soliciting new industry.

### Builds Cement Plant

REPUBLIC CEMENT CORP., Prescott, Ariz., has awarded a \$6,500,000 contract to Brown & Root, Inc., Houston, Texas, for design, engineering and construction of its cement plant at Drake, 30 miles north of Prescott, Ariz. The plant is expected to have a daily capacity of 3300 bbl. of cement when the project is completed. Mark Lintz, San Francisco, Calif., consulting engineer and cement specialist has been selected to serve as an advisor and consultant at the Drake plant, and Burney C. Prigge is president.

### Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of April, 1956, were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during April, 1956
Roads .....	3,763,988
Streets and alleys .....	3,477,019
Airports .....	837,343
Total .....	7,578,350

### Buy Crushed Stone Firm

LEROY LIME & CRUSHED STONE CORP., LeRoy, N. Y., has been purchased by a group of businessmen headed by Victor Brunner of Buffalo, N. Y., from J. Leonard Heimlich. No change in the operation of the firm is planned. Mr. Brunner has been elected president of the company and other officers are John F. Judge, vice-president, and William E. Hanson, secretary.

### Adds Dust Collectors

SOUTHWESTERN PORTLAND CEMENT CO., Los Angeles, Calif., added dust collection equipment at the El Paso, Texas, cement plant, replacing outmoded equipment. Herman Liebreich, assistant manager, said the equipment is not only important in cutting down air pollution caused by escaping dust, but also saves a valuable amount of usable material.

### Geology Exhibit

NEW YORK TRAP ROCK CORP., New York, N. Y., held a Hudson River geology exhibit at two gatherings of engineers in the New York-New Jersey area. The first was the 30th annual convention and engineering industries exposition of the New York State Society of Professional Engineers, May 17, through 19 at the Hotel Stat-

(Continued on page 55)



**HOW** RAY-MAN CONVEYOR BELT  
gives you "More Use per Dollar"

**TRAINS NATURALLY**

**RESISTS IMPACT**

**HOLDS FASTENERS**

## This Heavy Duty Belt Cuts Cost in Tough Hauls!

Ray-Man Conveyor Belt is engineered to stand up where ordinary belts tear, puncture, or experience fastener pull out. Elastic cushioned strength member plies made from strong, natural and synthetic fabric give this belt resilience to the impact of shock loading flexibility to trough easily and train naturally. Compensated, balanced construction relieves outer ply stress, prolongs belt life. Ray-Man requires no breaker strip and offers exceptional fastener holding ability under extreme conditions of use. Ray-Man Conveyor Belt cuts handling costs because it does a better job . . . and it lasts longer.

Like all Manhattan heavy duty conveyor belts,

Ray-Man is mildew-proof and moisture resistant. R/M's exclusive "XDC" Cover protects the belt against wear, tear, cuts and abrasion to a degree never before attained.

For unusually abusive shock loading, R/M's extra-cushioned Homocord Conveyor Belt may be better suited for your job. An R/M representative will help you compare the advantages of all R/M Conveyor Belts to determine the one that will cut your handling costs most . . . give you "More Use per Dollar" in your operations. Contact him today . . . or write for Bulletin 6906 and 6915.

RM 501A



MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY  
**RAYBESTOS-MANHATTAN, INC.**



Flat Belts



V-Belts



Conveyor Belt



Hose



Roll Covering



Tank Lining



Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

ler, New York City, and the other was the joint annual convention and exhibition of the National Society and the New Jersey Society of Professional Engineers, May 24, through 26 at the Ambassador Hotel, Atlantic City, N. J.

The geology exhibit was made up of samples of most of the rocks found in the Hudson Valley, mounted on a display board. A relief map, in color, of the valley area, identified the origin of each of the rock varieties.

### Safety Campaign

THE NATIONAL SAFETY COUNCIL is sponsoring a nationwide campaign to reduce accidental falls, and is endeavoring to focus attention of management and workers on this one type of accident. The council has singled out falls for special emphasis because of their great importance in the total accident picture. Falls account for more accidental deaths and injuries than any other cause, with the exception of traffic accidents. Falls take a heavy toll of workers, ranking just after handling objects as the greatest cause of disabling occupational injuries. Falls are costly accidents, frequently resulting in death or serious injury and compensation payments are substantially above those for other accidents. Falls also account for more than half the injuries to office workers, according to a recent study of the Department of Labor.

### Limestone Division Meets

THE AGRICULTURAL LIMESTONE DIVISION of the Pennsylvania Stone Producers Association recently held its annual meeting at Harrisburg, Penn., with 50 members and guests attending. Officers elected were: D. K. Shroyer, chairman; Fred E. Roberts, vice-chairman; H. M. Binkley, treasurer; and H. H. Wagner, secretary. Board members elected were: Walter Hamme and H. H. Snyder in the eastern section; W. O. Faylor and Dean Fyock, central section; and Robert Hammett and Elmer A. Snyder, western section.

### Adds Cement Kiln

BESSEMER LIMESTONE & CEMENT CO., Youngstown, Ohio, has added a 12- x 450-ft. rotary kiln at its cement plant near Bessemer, Penn. The kiln is part of a \$4,500,000 expansion program currently underway.

### Egyptian Cement Operation

A CEMENT PLANT being built in Egypt has been scheduled for completion by November, 1958, with a daily production capacity of 1400 tons. The construction contract was awarded to a Czechoslovakian firm, which made

the most suitable offer for the supply of machines and equipment. Currently, Egypt is suffering an acute shortage of cement due to the many construction programs in progress.

### Canadian Asbestos Exports

ASBESTOS SHIPMENTS from Canadian mines dropped slightly to 67,853 tons in February, 1956, from 68,520 tons during February, 1955. During the first two months of 1956, shipments amounted to 126,724 tons, down from 129,486 tons for the same months a year previous. Exports in January, 1956, rose to 65,661 tons from 56,175 tons a year ago.

### Adds Storage Silos

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has added 24 cement storage silos, which cover an area 227 ft. long, at its Buffalo, N. Y., cement plant. The silos will furnish an added 350,000 bbl. of cement storage, permitting faster loading for railroad cars and trucks, and provide stockpiling facilities during the winter.

### Safety Record

CUTLER LALIBERTE-McDOUGAL LIME PLANT employees were honored recently at a banquet at Hotel Superior, Superior, Wis., for having attained a record of six years without a lost-time accident. Lloyd Hagen is superintendent of the plant.

### Perlite Directory

THE PERLITE INSTITUTE has published a "Perlite Brand Names Directory," listing more than 150 brand names for expanded perlite products.

The brand names were listed by 63 perlite processing companies in response to an industry-wide survey, bringing to light 42 different products or applications in which perlite is a primary ingredient. More than 80 percent expanded perlite is used as an aggregate for lightweight plaster and insulating concrete, and 47 brand names were recorded for this type of product. The remainder were used to describe such products as filter aid, foundry-grade perlite, insulation pellets, oil well cementing materials, rooting medium for flowers and vegetables, soil conditioner, insecticide carriers, fertilizer anti-caking agents and similar materials. The directory, which also offers "where to buy" information, is available without charge from the Perlite Institute, 45 West 45th St., New York 36, N. Y.

### India Buys Cement

THE INDIAN GOVERNMENT has announced it is purchasing 400,000 tons of cement from East European countries including Russia and Romania. The announcement stated that these countries made the best offers after India, in order to meet a cement shortage, asked countries in soft currency areas to submit bids.

### Iceland Cement Plant

PLANS HAVE BEEN SUBMITTED for a \$2,300,000 cement plant in Iceland, the construction to be handled by a Danish firm. The cost will be covered by a loan from the United States of the local currency proceeds from the sale in Denmark of U. S. surplus flour and grain.

## Coming Conventions

**June 12-13, 1956—**

**Empire State Sand, Gravel and Ready Mix Association, Annual Meeting, Mark Twain Hotel, Elmira, N. Y.**

**June 17-22, 1956—**

**American Society for Testing Materials, 59th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.**

**October 1-4, 1956—**

**American Mining Congress, Metal Mining and**

**Industrial Minerals Convention, Shrine Exposition Hall, Los Angeles, Calif.**

**October 10-12, 1956—**

**National Lime Association, Operating Meeting, Kentwood Arms, Springfield, Mo.**

**October 22-26, 1956—**

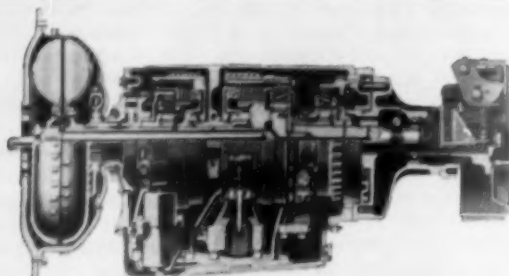
**National Safety Congress and Exposition, Conrad Hilton, Congress, Morrison and LaSalle Hotels, Chicago, Ill.**

# Now there's a great automatic transmission for whichever Chevy truck you choose

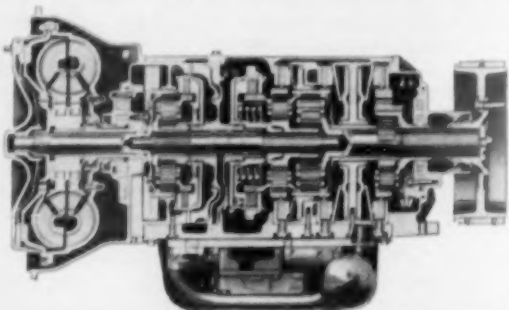
Famous Chevrolet **Hydra-Matic**, or all-new **Powermatic**, provides easy, safe automatic driving that's tailored for your truck!

Pick any Chevrolet truck . . . and you'll find there's a modern automatic transmission to make your hauling easier, safer, and more profitable!

If your choice is a Series 3000 or 4000 model, there's **Hydra-Matic**. This modern automatic transmission not only gives you the ease of no-shift hauling . . . it also *saves you maintenance money* because the hydraulic coupling protects drive-line parts from shock loads. Or, if your job calls for a 5000 through 10000 Series Chevy, there's exclusive **Powermatic**—the first automatic transmission



**Hydra-Matic**—optional in Series 3000 and 4000 models at extra cost—brings new ease to tough jobs, cuts hauling time and maintenance expense.



**Powermatic**—optional in Series 5000-10000 models at extra cost—assures the easiest, safest big-truck operation ever known! It's a Chevrolet "first."

designed especially for big trucks! Six fully automatic forward speeds and a torque converter virtually eliminate manual gear shifting on hills or in traffic! A revolutionary "retarder" assures safer down-hill hauling, less brake wear and you make better time through traffic because all shifts are "power-on" shifts!

Now *automatic driving*, available throughout the Chevrolet truck line, gives you one more reason to see your Chevy dealer soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.



**Chevrolet truck  
manual transmissions  
are great performers, too!**


To give you extra pulling power in the medium- or heavy-duty model you select, Chevrolet trucks provide big, rugged heavy-duty 4-speed Synchro-Mesh transmissions, or brand-new "New Process" 5-speed transmissions!\*

\*Optional at extra cost in 5000-6000 through 8000 Series models, standard in 9000-10000 Series models.



## NEW CHEVROLET TASK·FORCE TRUCKS

Anything less is an old-fashioned truck!



# JALLOY

takes the beating

Quarrying operations demand tough trucks and tougher truck bodies. This 15-ton, rear-dump Euclid relies on Jalloys plates for rock-resistance.

## Jalloy heat treated steels . . . cut maintenance—give longer wear life

Jalloy—special purpose steels that are heat treated to provide longer wear on applications where impact and abrasive conditions are severe—last 4 to 20 times longer than conventional mild steels. Furthermore, they are easily welded.

Jalloy is available in three grades:

**No. 1**—for applications requiring excellent formability or where a low carbon alloy steel possessing good physical properties before or after heat treatment is specified. This is an ideal carbonizing grade.

**No. 3**—a general purpose steel capable of being heat-treated to excellent physical properties. Compared to ordinary mild steels it offers good resistance to abrasion or wear in the as-rolled state; but when heat treated to Brinell 340 and above, optimum abrasion and impact resistance is secured.

**No. 7**—possesses high hardness together with good ductility or wear resistance. Excellent for spring applications as well as flat work.

Jalloy high strength steels are available as plates, structurals, bar and small shape sections, hot rolled sheets, as well as strip and wire products.

Complete data concerning  
*Chemical Composition . . . Heat Treatment . . . Weldability . . . Physical Properties . . .* will be mailed to you promptly. Write today for your copy.

**Jones & Laughlin**  
STEEL CORPORATION • PITTSBURGH





New Barber-Greene conveyor, erected in just 2 1/2 days after the fire, boosts tonnage from 250 tons a day to 250 tons per hour.

## Conveyor destroyed by fire on Monday New one operating Friday

On Monday fire roared up a wooden conveyor owned and operated by a Milwaukee cement block company. Out of the devastation only the wooden "A" frames remained. Without the conveyor, production was at a standstill.

At 6:00 the following morning the owner called the local Barber-Greene distributor to see what could be done. Drawing from his own

stock of standardized conveyor components—trusses, idlers, drives—the distributor was able to rush all the necessary components to the burned out plant by noon. And by Friday morning the new conveyor was erected and operating.

This fire and the quick return to normal operations point up the basic advantages of Barber-Greene standardized components. These

advantages include: quick delivery from stocks of standardized components...elimination of engineering time required when building "custom-made" conveyors...and fast, easy erection.

Trouble-free operation is an additional benefit of the factory aligned and adjusted drives and terminals. Flexibility in shortening or lengthening your conveyor is another plus.

Write for information on Barber-Greene Standardized conveyor components

56-12-PE

# Barber-Greene

AURORA, ILLINOIS, U.S.A.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

# HINTS

## AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

### "Drop Ball" in Gravel Pit

DROP BALLS for secondary breakage in a quarry where crushed rock is produced is quite conventional prac-



Drop ball used to break up boulders in gravel pit

tice, but it is unusual in a sand and gravel pit. However, the illustration shows one in use in a gravel pit on the West Coast. It is improvised from a discarded spindle out of a 10-in. gyratory crusher, and it is used ahead of 3-cu. yd. 85-B Bucyrus-Erie shovel,

### Crusher Repairs Facilitated

A PENNSYLVANIA CRUSHED STONE PRODUCER had trouble in reaching the nuts in the jaw die of a 1000 t.p.h. crusher when they were joggled loose by vibration. The four 1½-in. bolts (thread size) were in a hard-to-reach internal spot and could not be drawn up tight enough with a hand wrench.

To solve the problem, an Ingersoll-Rand size 34U electric Impactool was obtained especially for this job. It worked so well that it is now used for other heavy jobs. On the crusher, the tool is also used to turn the three 1½-in. adjustment nuts which open and close the crusher jaw. It has been estimated by the stone producer that this tool saves up to 50 percent of the overall labor time, and on the specific operation of running and removing nuts, it is said to save up to 90 percent of the former time. It also does a better job than with hand wrenches. The tool is also used in the shop for



Operator tightening crusher jaw adjustment nuts with special impact tool. The adjustment on each nut takes only a few seconds

automotive repairs on dump trucks, fork lift trucks and power shovels.

The tool operates through the principle of rotary impacts which are automatically delivered to the work whenever resistance is met. No torque reaction is transmitted back to the operator which enables him to use the tool for long stretches without undue fatigue.

### Reclaiming Tunnel of Concrete Block

IN THE ILLUSTRATION is shown a reclaiming conveyor tunnel which is constructed of modular concrete block and vertical steel reinforcing with the roof of precast reinforced concrete slabs. The side wall reinforcing is tied into the roof. This construction makes



Left: Filling self-dumping hopper. Right: Fork lift truck dumping hopper in action

an efficient, economical and lasting type of reclaiming tunnel.

An arrow points to water sprays used on the under side of the reclaiming belt conveyor. Sand is loaded on this belt at the rate of 450 t.p.h., using a Barber-Greene radial stacker assembly that fingers out over three parallel



Reclaiming belt conveyor emerging from tunnel made of concrete block. Water is sprayed on underside of belt

railroad tracks. Car-loading can be expedited by the use of these tracks. Trucks also can be loaded by the radial stacker.

### Self-Dumping Hoppers

CONCRETE CORPORATION, Long Island City, N. Y., is using self-dumping hoppers on lift trucks to carry materials to areas not reached by crane. The company makes cinder concrete block and receives its cinder aggregate by barge. An overhead crane transfers aggregate from barges to a

(Continued on page 61)



## Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back at ground level gets **BIGGER LOADS** with less spillage.



## Keeps More

Heaped loads are cradled closer to the machine for greater stability and can be carried at lower level. Exclusive load shock-absorber cushions the load during travel, smooths out the ride, and permits faster movement with less spillage.



## Delivers More

Since you get **MORE** to begin with and keep **MORE** while traveling at higher speeds . . . with less spillage in both instances . . . the result—you *deliver* **MORE**. This new **PAYLOADER** is a more **PRODUCTIVE** machine which will handle more yardage at lower cost.



# more yardage at lower cost... New 2 $\frac{1}{4}$ yard **PAYLOADER**<sup>®</sup>

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. All the *exclusive* features that increase yardage output enable it to handle many kinds of jobs never before practical with wheeled tractor-shovels.

It operates easier and faster, rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want *proof* of its *productive capacity* and superior *performance*, ask your "PAYLOADER" Distributor for a demonstration.

## Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base, the utmost in stability is achieved.

## More Production, Less Effort

Power-steering, power-brakes on all four wheels, power-shift with no clutching or stopping for range changes and good balance and riding qualities reduce operational fatigue — promote full production all day.

## Digging Power

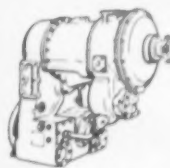
Pound for pound, the new model HO has more traction and digging power — for a wider range of ground conditions — than any wheeled tractor-shovel ever built.

## Torque-Proportioning Differentials Reduce Wheel Slipping

Another exclusive "PAYLOADER" feature which assures better traction under adverse conditions. If one wheel starts to spin, more power is delivered automatically to the other wheel.



Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing keep torque low in axles, prolong life of drive-train parts as well as axles.



## Complete Power-Shift Transmissions

"Complete" since ALL shifts can be made instantly and on-the-go, under full engine speed.

There's NO STOPPING for a range-shift, there's no foot clutch pedal. With the forward-reverse control, the operator can "inch" the machine while maintaining full engine speed to provide maximum bucket lifting and dumping power. Torque converter drive cushions power-train shocks.

## THE FRANK G. HOUGH CO.

705 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER" tractor-shovels:

☐ model HO ☐ model HJ ☐ model HH  
 2 $\frac{1}{4}$  cu. yd. heaped, 1 $\frac{3}{4}$  cu. yd. heaped, 1 cu. yd. heaped,  
 1 $\frac{1}{2}$  cu. yd. struck 1-1/3 cu. yd. struck  $\frac{3}{4}$  cu. yd. struck

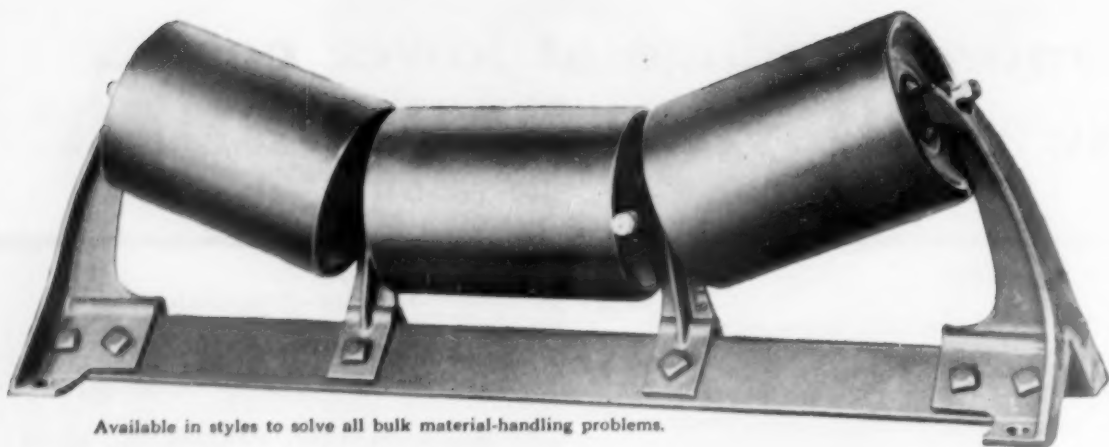
Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Street \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_



**PAYLOADER<sup>®</sup>**

MANUFACTURED BY  
**THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.**  
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY





Available in styles to solve all bulk material-handling problems.

for heavy handling under adverse conditions

## JEFFREY RELIANCE BELT IDLERS



Jeffrey idlers awaiting installation on a cross-country coal conveyor from mine to power plant...



and at work on a heavy hauling job.

Jeffrey idlers offer every feature essential to belt protection, dependability and long service. Equipped with roller bearings, these Reliance idlers assure maximum efficiency and economy of conveyor belt operation.

The outer shell of the rolls is made of high-quality steel tubing, into which the ends are carefully centered and welded, forming a one-piece balanced roll. Corners are rounded to prevent injury to the belt. The sturdy, malleable-iron stands are die straightened to assure proper alignment and snugness of fit.

All parts of the Jeffrey Reliance idler are inter-

changeable. Idlers and parts are always available, ready for shipment from factory or distributor stock. The Jeffrey Manufacturing Co., Columbus 16, Ohio.



# JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT •  
TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

storage pile a few yards from the dock. Variations in production frequently cause the storage pile to grow too big for effective handling.

In this case, the crane dumps aggregate directly into a 2½-cu. yd. Roura hopper. A fork lift truck moves the hopper to a second storage area where the operator flips the locking handle to allow the hopper to dump itself, thus avoiding the need for manual shoveling. Crane bucket and hopper capacities are equal and the entire operation is timed to flow smoothly.

The hopper also is used as a "grader" to fill ruts and holes with aggregate for a better roadway, and as a "mobile trash unit" in carrying waste from the plant to dump trucks.

### Primary Crusher Warning Signal

AT A MIDDLE WEST QUARRY an electrically operated horn is located along side the 42-in. by 12-ft. pan feeder which discharges to the primary jaw crusher. The horn is sounded by the



To the right of the pan feeder is the electrically-operated horn which may be sounded by the screen tower operator to notify the primary crusher operator to shut down the crusher and main belt conveyor in case trouble develops

man in charge of the screening tower so that the main belt conveyor and the crusher can be shut down should any trouble develop. There also is a switch at the base of the screening tower.

Below and to the right of the horn are the variable controls for the pan feeder. This is a convenient arrangement in regulating the supply of stone to the primary crusher.

### Reconditioning Tractor Parts

MANY INGENUOUS METHODS of rehabilitating worn tractor parts have been practiced in recent years. While some of these salvage methods proved to be practical and economical, others were expensive but essential to keep badly needed equipment in operation.



Installing valve seat inserts in cylinder heads of engines

D. R. Lammers, service manager, Caterpillar Tractor Co., has pointed out that in addition to the more common-place practices of regrinding crankshafts, turning track pins and bushings, and re boring and sleeving bearing bores in transmission cases and final drive covers, many other parts can be saved for further useful life.

Reference was made to etching and raising the ridge in worn cylinder liners, using wide top compression rings on worn pistons, and installing valve seat inserts in cylinder heads. Hard-facing cutting edges and bucket teeth, straightening sheet metal guards and hoods, and building up with electric weld worn spots on heavy fabricated steel parts will continue to be a popular practice. Other welding practices include building up track grouser, track rollers, idlers and sprockets, and regrinding track roller shafts using undersize bushings. Welding new rims on sprockets, building up the outside of worn steering clutch drums or using

extra-thick brake linings, and installing clutch drive rings in flywheels also have become widely accepted.

Some reconditioning practices, however, are questionable. Not necessarily because they cannot be done successfully but they may not be economical. Mr. Lammers points out, for example, that reconditioning of track links is in this category. It is also not considered advisable to repair fuel injection pumps.

### Dry Ground Mica Use

GENERAL ELECTRIC Co., Schenectady, N. Y., has developed a special insulating use for dry ground mica, consisting of a combination of silicone and fine mica. The insulating material was developed specifically to meet needs for a product which could be used on certain types of large direct-current motors.

Advantages of the insulating material are said to be better dielectric strength than flake mica tapes, elimination of voids common to mica tapes, more flexibility, moisture resistance, and elimination of puffiness.

### Launder for Sand-Water Pulp

TRANSPORTATION of sand-water pulp over a considerable distance was accomplished by one company by the use of a long steel launder line with ¾-in. Bethlehem Steel Co. (AR) abrasion-resistant plate. The launder shown in the illustration is over 300 ft. long, and is supported by steel cables from a suspension bridge type structure. The launder carries up to 5000 g.p.m. of abrasive pulp. The suspended launder permits unobstructed operation of all types of vehicles in the area below.



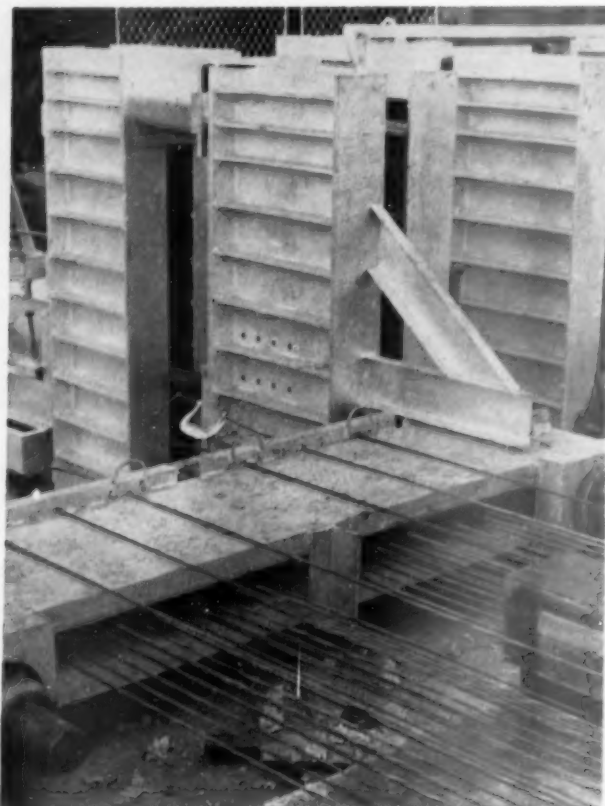
Launder carrying sand-water pulp carried by suspension bridge structure

# 3 WAYS TO BUILD WITH



## \* FIRST OF ITS KIND

This Lincoln Tunnel Retaining Wall was designed and built by the Port of New York Authority. A maximum of 50 feet high, the wall consists of concrete piers poured in place with slots in the sides. Precast, prestressed panels are dropped into these slots to form the wall. This is the first use of this type of construction in the United States. The panels are 4 feet wide and either 12 inches or 18 inches thick. They are pretensioned to 175,000 psi, with thirty-two or forty-six  $\frac{3}{8}$ " diameter American Special High Strength Stress-Relieved Strands. Panels were manufactured by Precrete, Inc., Astoria, Long Island.



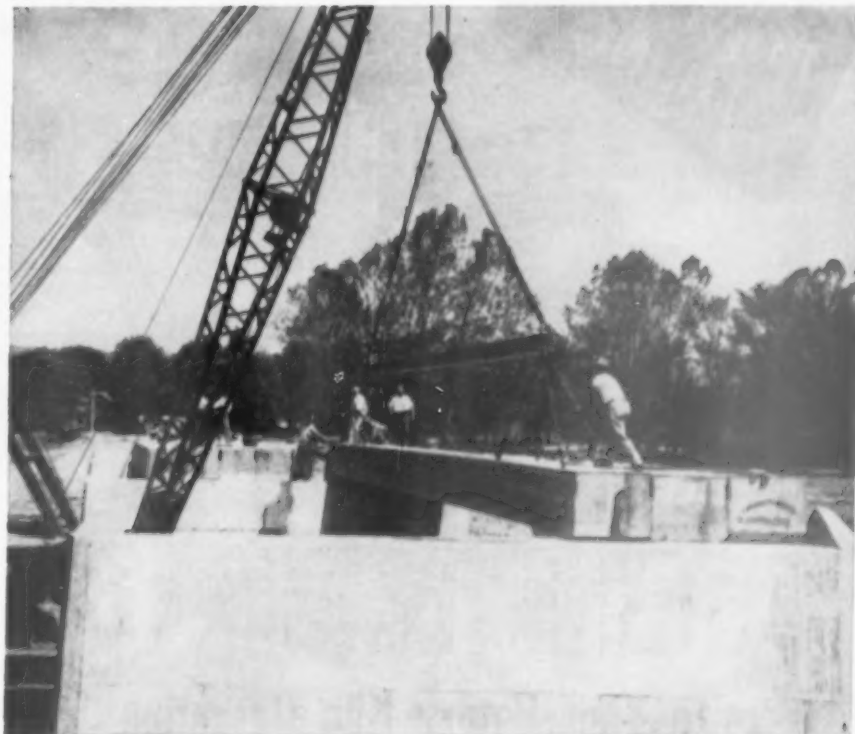
## \* TWO MODERN IDEAS AND ONE OLD

American Welded Wire Fabric has been used for more than 30 years to reinforce all types of concrete construction. American High Strength Stress-Relieved Strand for prestressed concrete, a high-quality product developed expressly for this application, is now also being used extensively in all types of construction. A typical installation is this large shopping center at Roosevelt Field in New York, where precast welded wire fabric reinforced channel slabs combine with pre-



cast prestressed slabs to make a better building. The reinforced slabs, 16 feet long, use American Welded Wire Fabric, 3" x 8"-3 gage x 8 gage. The prestressed slabs, in lengths of 27', 31'-6", and 33'-6", are pretensioned with American High Strength Stress-Relieved Strand. This is a Webb & Knapp project, designed by Bohler and Bugnoni. Structural Engineers were Severud-Elstad-Krueger of New York City. Slabs were manufactured by Precrete, Inc., Astoria, Long Island.

# PRESTRESSED CONCRETE



## • CUTS COST

The prestressed beams for this concrete bridge in Pennsylvania cost far less than conventional built-in-place members of equivalent strength. They were pretensioned with American High Strength Stress-Relieved Strand. Prestressed concrete often saves money because it can be precast on an assembly-line basis at a factory. In addition, prestressed members take less concrete and steel because the high strength steel is stronger and does "more work" per pound used. And prestressed members can be installed more quickly.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL • GENERAL OFFICES: CLEVELAND, OHIO  
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS  
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**FACTS!  
about  
making  
concrete  
stronger!**

American Steel & Wire  
Room 1-46, Rockefeller Bldg.  
Cleveland 13, Ohio

Please send me complete technical data on the following products:

- ☐ American Super-Tens Stress-Relieved Wire and High Strength Strand for Prestressed Concrete
- ☐ American Welded Wire Fabric Reinforcement

Name .....

Firm .....

City ..... State .....



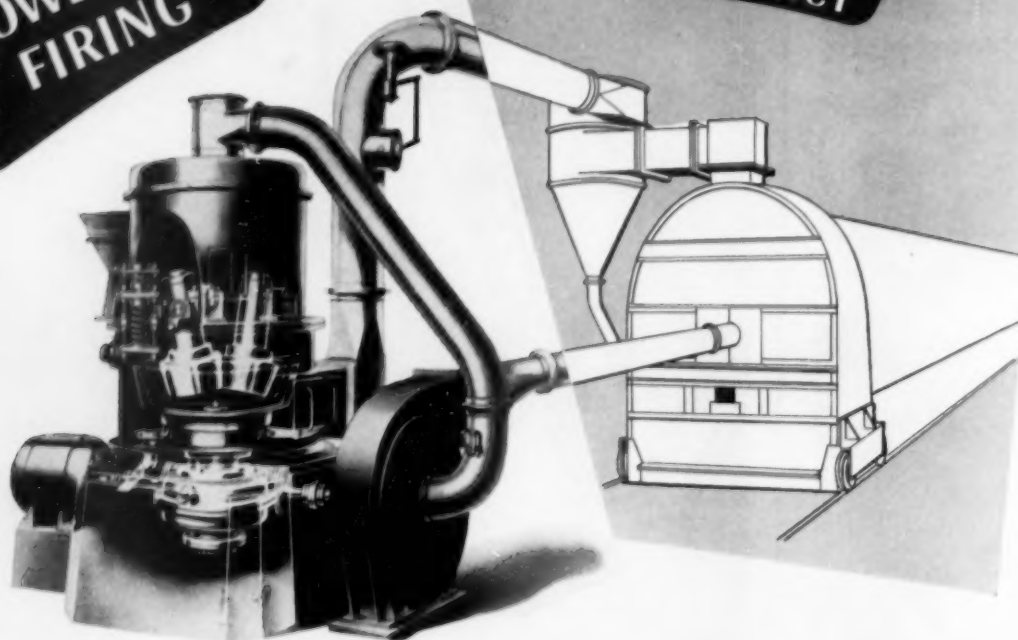
USS AMERICAN *Super-Tens* Stress-Relieved WIRE  
and  
AMERICAN HIGH STRENGTH STRESS-RELIEVED STRAND

UNITED STATES STEEL

ROCK PRODUCTS, June, 1956

*Raymond*  
**BOWL MILL  
FIRING**

**TOP LEVEL  
KILN  
EFFICIENCY**



## Modernize Your Rotary Kiln Operation . . .

with the Raymond BOWL MILL . . . a complete, fully coordinated system with flexible control and automatic operation. This modern direct-firing unit is specifically designed and built for its job. It not only provides utmost economy in coal pulverizing but also delivers a proper coal-air mixture to the burner to insure maximum kiln performance.

Producers of cement, lime and dolomite are equipping their new plants with batteries of Bowl Mills . . . or converting their old plants, one by one, to modern Bowl Mill installations. Increased savings and advantages are due to these Bowl Mill features:

- (a) Handles coal of any grade or moisture content
- (b) Easily adjusted or lubricated while running
- (c) Sturdily built for continuous 24-hour operation
- (d) High availability and wide range capacity

For a better product, lower costs and dependable performance . . . choose the Bowl Mill on its 20-year record . . . over 2000 now in use.

**VISUAL  
CONTROL  
PANEL**



Write for the new  
Raymond Catalog #75

Raymond control system gives complete operating picture of mill at all times, and permits easy supervision of one or several Bowl Mills.

**COMBUSTION ENGINEERING, INC.**  
*Raymond Division*

1307 NORTH BRANCH ST.  
CHICAGO 22, ILLINOIS

Combustion Engineering-Superheater Ltd. Montreal, Canada

SALES OFFICES IN  
PRINCIPAL CITIES

# NEW MACHINERY



## Air Cooled Electric Plant

UNITED STATES MOTORS CORP., Oshkosh, Wis., has announced an addition to its line of air cooled electric plants, which is rated at 10,000 watts continuous output, and is specially adaptable to large jobs where a number of electric tools and lights are used simultaneously, and emergency standby service for lights, power, and radio service. Utilizing a 4-cylinder, 4-cycle Wisconsin VF4, V-block 1800 r.p.m. engine, the engine generator weighs 730 lb., is 43 in. long and 29 in. high. It is available with standard voltage, single and three phase generators. Standard equipment includes a muffler, air cleaner, fuel pump, magneto ignition with radio shielding and two rate battery charging circuit on electric start models.

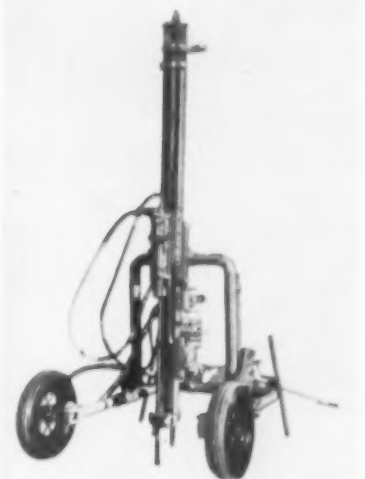


## Crawler Tractors

INTERNATIONAL HARVESTER CO., Chicago, Ill., has announced four crawler tractor models, the TD-18, TD-14, TD-9 and TD-6. Principal engineering changes are increased horsepower ratings in the TD-6 to 41.5 hp., the TD-9, to 66-hp., and the TD-14 to 89.5 hp.; better operator visibility; Cerametallic clutch facings; pressurized covering systems; 500-hr. track roller seals; and all-weather, positive, easy-starting conversion systems.

The TD-18 features 500-hr. track roller seals, heavier radiator guards,

and an improved streamlined appearance. A gasoline-conversion, electric starting system is provided as standard equipment, and the Cerametallic clutch is also featured as standard equipment. Lubrication of the steering clutch assemblies has been centralized, and pressurized cooling is provided. The TD-18 produces 124 hp. at 1450 r.p.m., the drawbar pull is 24,300 lb., and drawbar hp. is 103.



## Air-Driven Wagon Drills

THOR POWER TOOL CO., Aurora, Ill., has announced two air-driven wagon drills, featuring fully automatic controls grouped on a motor which can be re-positioned along the mast. The drills are designated the SW-1, a general purpose model, and the BW-2, a heavy duty unit. The SW-1, mounting either a Thor 75 or 77 sinker rock drill or a Thor 82 or 92 drifter, is equipped with a saddle and cone permitting mast adjustment for drilling holes through a full 360 deg. in all directions. The chassis collapses by means of a worm drive, for drilling at various levels down to extremely low positions for snake or lifter blast holes.

The BW-2 heavy-duty wagon drill (illustrated) was redesigned and improved to replace the BW-1 unit. Built around the Model 105 drifter, the rig incorporates a mast with improved chain tension adjustments and shock absorbers for the 4-in. bore drifter. It can be used with Model 82 or 92 drifters as well as the 105 drifter unit.

The mast alone is available as a separate unit for operation on a "quarry bar," or in tandem mounting for pipe line drilling. The mast has grouped, movable controls including lever-operated blower control and a motor feed control with a variable feed ranging from 2 in. per min. to full speed for fast return or approach. The chassis has a re-designed hand crank for raising or lowering the mast, and a positive 90 deg. wheel lock for line drilling.

## Plastic Insulated Connecting Wire

COLEMAN CABLE & WIRE CO., 4515 W. Addison St., Chicago 41, Ill., has brought out a connecting wire for blasting purposes, made of No. 18 aluminum connecting wire with a plastic insulation. The No. 18 aluminum wire is said to be equal in electrical characteristics to the conventional No. 20 copper wire.

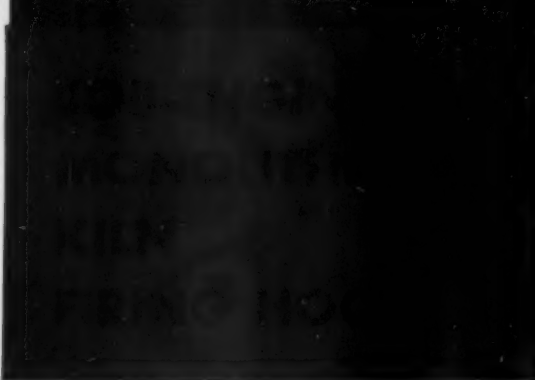


## Crane Air Controls

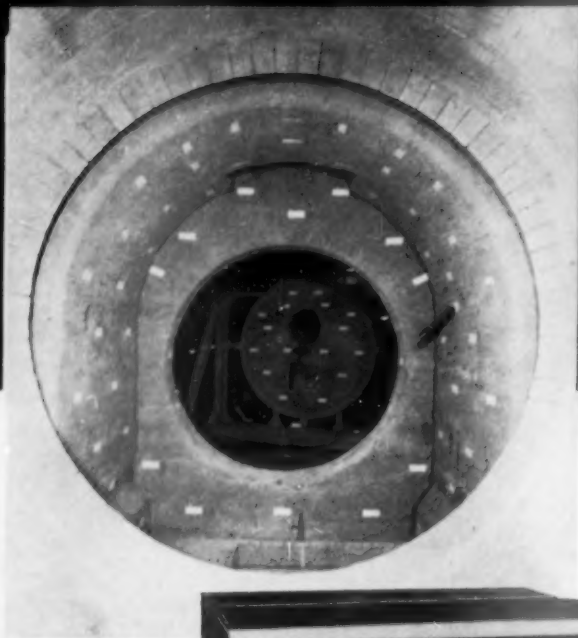
THE THEW SHOVEL CO., Lorain, Ohio, has added "Air-Ease" air controls on eight models of its line of Lorain power shovels and cranes, the eight models ranging from 20 to 30 ton capacity on crawler and rubber tire mountings. The controls operate

(Continued on page 59)

## A. P. GREEN . . . SUPER HYBOND



A. P. Green job-engineered monolithic refractory linings readily meet the complex construction requirements and varied service conditions in rotary kiln firing hoods. Furthermore, they offer specific advantages which can be money-savers.



The photograph illustrates A. P. Green SUPER HYBOND as recommended and installed in a typical firing hood. Notice the joint-free surfaces and positive anchorage throughout the lining. These features provide maximum protection against premature failure resulting from dust penetration, bulging, and buckling. Complicated, expensive masonry has been eliminated, as have resulting structural weaknesses.



### **SUPER HYBOND**

is a natural choice for such installations. It is a super duty plastic that develops high strength throughout the entire thickness of the lining—increasing the holding power of the anchors. Its high refractoriness readily withstands excessive temperatures, such as might occur in the seal ring or crown areas. Spalling and abrasion resistance are excellent.

A. P. Green offers a complete line of refractory products for the cement and lime industry. Whatever your requirement, for specific recommendations without obligation, contact your local A. P. Green Distributor . . . he's listed in the yellow pages of your telephone directory.

## **A. P. GREEN FIRE BRICK COMPANY**

Mexico, Missouri, U. S. A.

PLANTS: Mexico, Mo.—Woodbridge, N. J.—Sulphur Springs, Texas  
IN CANADA: A. P. Green Fire Brick Co., Ltd., Toronto 15, Ontario

*A. P. Green*  
**REFRACTORY  
PRODUCTS**



all friction clutches by full metered-air power. Two levers are used to control the following operations: boom derricking, boom brake, swing, crowd, retract, hoist, clam holding, drag-in, power load lowering and third drum. On self-propelled rubber tire units, travel is also controlled by metered air. On crawler machine with these controls, an additional set actuates all crawler operations such as tread and travel locking pawls, shifting of jaw clutches for selection of travel or swinging, steering, and turntable swing lock. On shovels, the dipper trip is air operated. Air booster operation of the secondary hoist drum brake and main hoist brake is also available.



#### Potentiometer-Recorder

BARBER-COLEMAN Co., Wheelco Instruments Div., Rockford, Ill., has developed the Series 8000 electronic potentiometer-recorder of the null-balancing type. The unit is completely self-contained and requires only an external sensing device. It is available in a wide range of models which measure, indicate, control, and give a permanent record of such variables as temperature, speed, strain, pH, and other quantities that can be resolved into electrical signals.

An outer door swings open 180 deg. to permit close examination of the chart, and both the chart rolls and the chart and recorder drive assembly swing out 180 deg. the opposite way by means of a two-way operating knob. The amplifier chassis uses plug-in components with standard electronic tubes.

#### All-Purpose Lubricant

PROTECTO LUBE Co., 2832 East Brand Blvd., Detroit 11, Mich., has announced "Primaleen," an all-purpose lubricant which is said to fill the pores of the surface lubricated, reducing friction at high pressures, high sliding velocities, and close clearances. The lubricant is also said to resist water, chemical vapor and temperature changes, and not to drip even when afire. It is recommended for conveyors, bearings, slides, gaskets, packing,

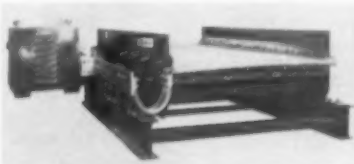
gears, shafts, guide pins and die sections, valves and stems, machine ways, etc. Other advantages claimed for the lubricant are: no flaking or crystallization at 30 deg. F. below zero; a 355 deg. F. open cup flash point; and protection against rust, resulting from use of soluble oils.



#### Tractor-Shovel

THE FRANK G. HOUGH Co., Libertyville, Ill., has announced the Model "HO" Payloader tractor-shovel with a heaped capacity of 2 1/4 cu. yd. and a struck capacity of 1 3/4 cu. yd. In addition to a complete "no-stop" power-shift transmission and torque converter, the unit is equipped with planetary axles and torque-proportioning differentials. The torque-proportioning differential combats wheel slipping by automatically delivering more power to the opposite wheel, when the wheel on one side tends to slip. A hydraulic load shock-absorber is standard on the model, which cushions the load during travel cycles, reducing spillage.

Other features include: closed, pressure-controlled hydraulic system; power-steering; four-wheel hydraulic power brakes; oil-to-air heat exchanger for cooling the torque converter and transmission oil; a 12-volt electrical system on gas-powered models; accessibility, with batteries and oil reservoir located under cover behind the driver's seat; and a "pick-off" outlet for addition of hydraulically-operated accessories. The tractor-shovel is available with either gasoline or diesel power.

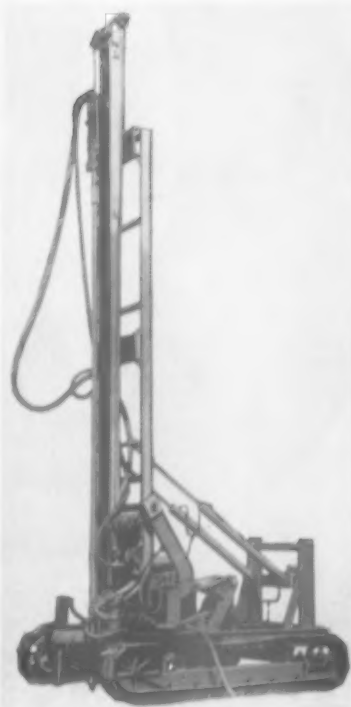


#### Heated Screen

SIMPLICITY ENGINEERING Co., Durand, Mich., has brought out the 4- x 8 ft. Model "SS" heated screen for the chemical process industry, agricultural lime production, clay-handling, or other operations where screening is especially difficult because of damp

or sticky materials. The screen has 35 sq. ft. of available screening surface, and has a balanced, high speed, short stroke assembly for positive action, distributing the vibration equally over the entire deck area.

Current is applied end to end for higher resistance, resulting in even distribution of more heat with a lower operating current. There is no inductance heating of side plates, and the transformer is a dust-tight unit specifically designed for screen heating. It includes a built-in overload switch to eliminate the possibility of burning out the transformer. The transformer may be mounted to the customer's specifications, and is designed to heat either stainless or carbon steel cloth at no extra cost.

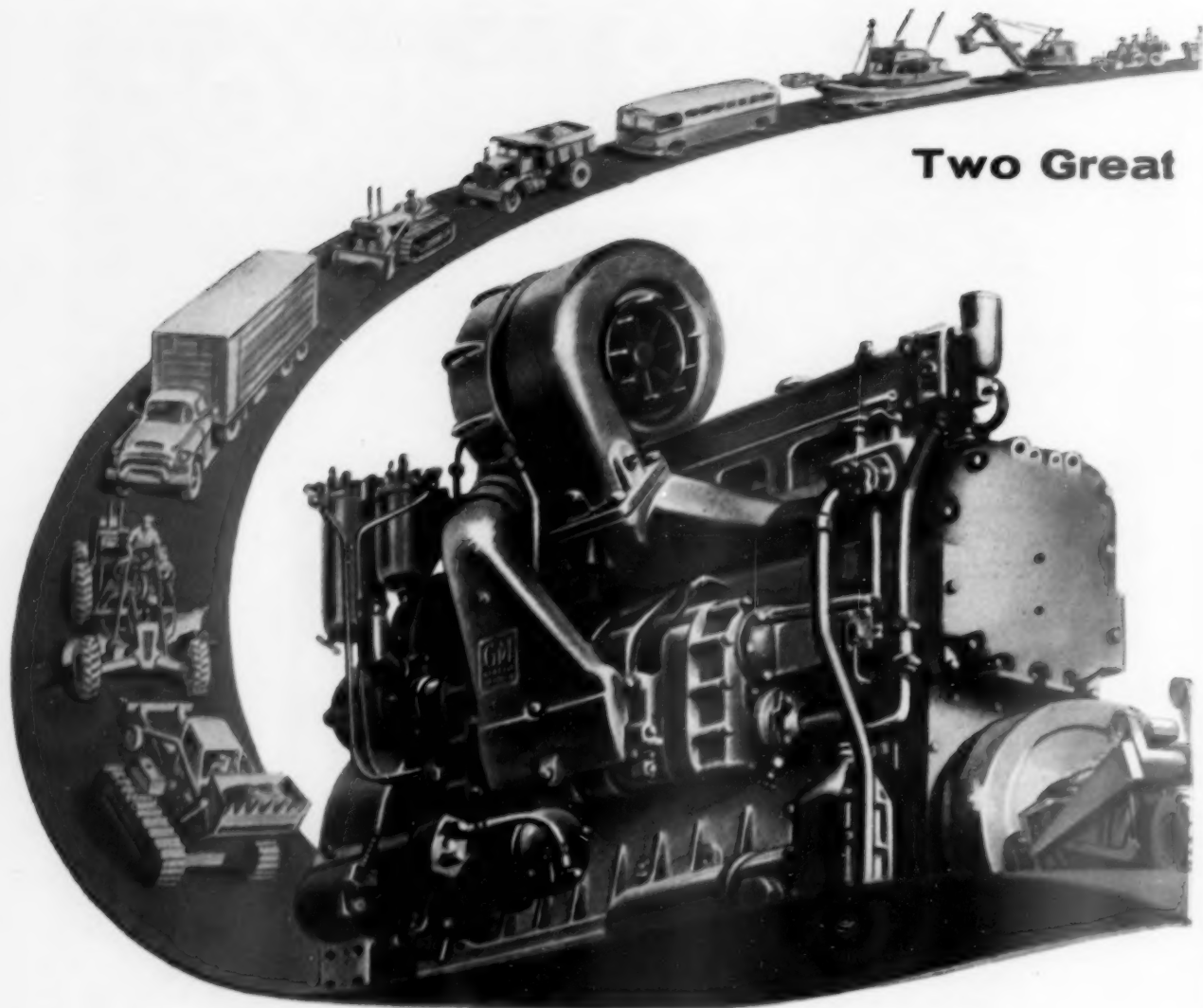


#### Percussion Rock Drill

GARDNER-DENVER Co., Quincy, Ill., has brought out the Model DH143 rock drill which has a 5 1/2-in. hammer diameter, and provides extra power for handling large size bits, and for fast penetration in hard rock. It features a selection of bit sizes, 3 1/2 in. to 5 in., for achieving best spacing and fragmentation efficiency in various rock breaking applications. A special line of carburized sectional drill rods, couplings and shanks has been developed by the company for use with the rock drill.

The unit is furnished with an air-powered crawler mounting which is

(Continued on page 73)



**Two Great**

## Increased Power—Decreased Fuel

Here's exciting news for power users—great new 4- and 6-cylinder GM Detroit Diesel engines that represent another long forward step by the leader in the Diesel engine field. With this new, more efficient Detroit Diesel Turbopower you can have up to 17% more power with no increase in fuel consumption—or the same power output with fuel saving up to 15%.

Detroit Diesel engineers have Turbo-charged 2-cycle Diesels by combining an exhaust-driven turbine with the engine blower to deliver a larger supply

of fresh air to the cylinders. Result: improved combustion, freer engine breathing, quieter and more efficient performance in the higher speed ranges.

Turbopower Diesels are additions to Detroit Diesel's time-proved Series 71 line, world's most widely used Diesel engines. The four-cylinder Turbopower Diesel delivers 171 H.P. at 2300 R.P.M.; the six-cylinder engine produces 280 H.P. at 2300 R.P.M.

To truckers Turbopower means speed-

ier, more economical movement of big payloads.

To boatmen it means faster speed or longer cruising range—more room for cargo.

To contractors and other industrial users it means greater work output from higher-powered engines or improved economy.

For the full story of 2-cycle Turbopower, write us or call your nearest GM Detroit Diesel Distributor or Dealer.

AMERICA'S LARGEST BUILDER OF DIESEL ENGINES



**New Engines Added**

**to General Motors 2-cycle Diesel Line**

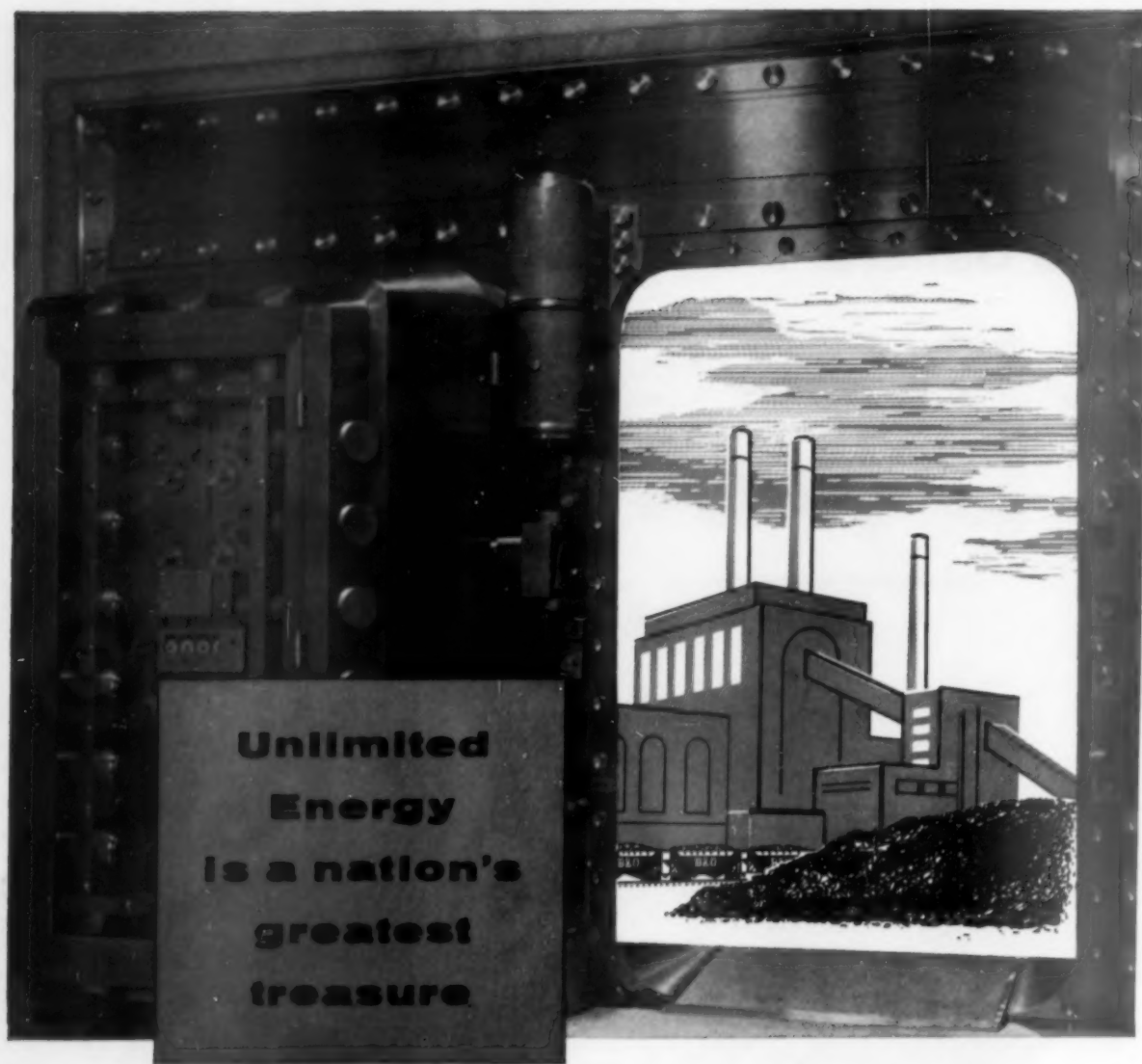
# *Detroit Diesel Turbopower*



**DETROIT  
DIESEL**

Engine Division  
of General Motors  
Detroit 28, Michigan

In Canada:  
GENERAL MOTORS DIESEL LIMITED  
London, Ontario



**Unlimited  
Energy  
is a nation's  
greatest  
treasure**

Modern industrial might comes from nature's harnessed energy. This nation's greatest single energy resource is found in its tremendous reserves of Bituminous coal.

As population increases—as living standards rise, vast additional amounts of energy will be required—and found in Bituminous—the fuel with a future.

Fields served by B&O contain known reserves of more than 8 billion tons suitable

for every purpose. The nation can safely bank on bituminous treasure like this and on B&O operators to mine and supply it in greatest quantities, with increasing efficiency at stable-low-cost. *Ask our man!*

*Let our Coal Traffic Representative suggest a constant-low-cost Bituminous coal for your needs—*

**COAL TRAFFIC DEPARTMENT**

**B&O RAILROAD • BALTIMORE 1, MD.**

*LExington 9-0400*

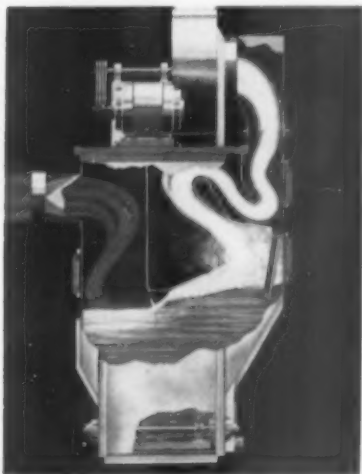


self-propelled and designed for maneuverability over rough ground. The chain feed drilling mast accommodates 20-ft. rod changes, and can be hydraulically adjusted to drill toe holes at 15 deg. below the horizontal. The unit can drill horizontal face holes as high as 8 ft. above the floor, and when set to drill at 10 deg. above the horizontal, the bit enters the face at a height of 10 ft. The drill and mast can also be mounted on a heavy-duty diesel tractor.



### Drum Magnetic Separator

STEARNS MAGNETIC, INC., Milwaukee, Wis., has announced a wet drum magnetic separator, known as the "WPD." It is designed specifically for efficient recovery of media in heavy density plants. The magnet is said to provide correct flux distribution for positive transport of the collected magnetics to the discharge point. Alnico permanent magnets are used, which are said to require no external energization, thus eliminating the cost of a rectifier or motor generator set.



### Wet Dust Collector

PANGBORN CORP., Hagerstown, Md., has brought out the "Ventrijet" wet dust collector, designed to provide the

proper atomizing of water and mixing with the air stream to permit efficient dust transfer by the movement of air without mechanical means. Dust-laden air enters the collector and expands in the inlet chamber at reduced velocity, the heavier particles sinking to the bottom of the tank as sludge. The air is drawn through one or more venturi tubes into the discharge chamber. The low pressure area in the venturi throat induces water also to enter the high velocity air stream, and the mixing of air and water causes the transfer of dust particles from the air to the water particles. The air, water and sludge mixture impinges at high velocity on special surfaces in the discharge chamber, and the sludge settles to the tank bottom. The washed air then flows through an eliminator section for removal of droplets and clean air is discharged. The unit is available in a range of capacities from approximately 1000 to 30,000 c.f.m. in single and double row tube types.



### Magnetic Vibrator

ERIEZ MANUFACTURING CO., Erie, Penn., has brought out a unit vibrator, designated the "Hi-Vi," which operates at 3600 v.p.m. The unit, which needs no rectifiers, provides a rapid "double-diaphragming" or kneading action in the bin wall, in effect expanding the lower half of the bin while compressing the upper half. This action prevents sticking, arching or bridging of materials while imparting a pulsating directional thrust which promotes and maintains a continuous, even supply of material through the bin outlet.

The combination of an electro-magnet and an Alnico V permanent magnet utilizes the principle of magnetic attraction and repulsion between magnetic poles, which are constant in the permanent magnet and alternating in the electro, thus setting up a rapid oscillation of the armature, powered on both strokes, to which is added the driving force of the energy stored in

the springing system. Two models are available: Model EU-20, designed for bins of 7-cu. ft. capacity and up to 1/16-in. thickness of bin wall; and Model EU-30, designed for bins of 20-cu. ft. capacity and up to 3/16-in. bin wall thickness.



### Heavy-Duty Lubricant

KEYSTONE LUBRICATING CO., 3100 No. 21st St., Philadelphia 32, Penn., has developed a lubricant for use on open gears on equipment such as cranes, shovels, dozers, trucks, concrete mixers, draglines, etc., requiring tough, long-lasting, highly adhesive lubricants. Known as Keystone No. 29 cartridge grease, it is particularly suited for service on open gears subjected to severe conditions of pressure, dust and high temperatures. It is available in three densities, medium, X-light and W, to meet a wide range of operating conditions, and is claimed to be unaffected by acids and alkalis and to have moisture repellent characteristics. Operating temperature ranges are: from 50 to 400 deg. F. for medium density; from 40 to 400 deg. F. for X-light density; and from minus 20 to 400 deg. F. for W density. The lubricant is applied with a gun applicator, even when the gears are in motion.



### Crane Carriers

FEDERAL MOTOR TRUCK CO., division of Napco Industries, Inc., 834 N. Seventh St., Minneapolis 11, Minn., has brought out 8-ton and 10-ton 6 x

(Continued on page 77)

**Announcing  
the NEW**

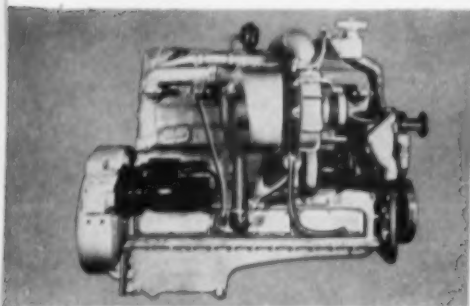
# International<sup>®</sup>

**MODEL 65 18 tons MODEL 95 24 tons**

## *Designed with the features you asked for*

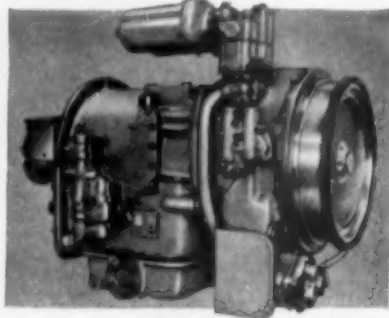
Hundreds of contractors, mine owners, quarry operators, and other equipment users told our engineers what they needed in an off-highway hauler. Their suggested design features have been carefully built into the new International Payhaulers. In these rugged, all-new, rear-dump haulers, you have greater horsepower-to-payload weight ratios than are available in most other off-highway trucks. You have stronger main frames to carry bigger payloads with rugged dependability. You have higher hauling speeds . . . full-power hoists for faster dumping . . . better all-around visibility.

These features are the result of rigorous, field testing. Payhaulers have worked on many contracting, mine, quarry, and similar jobs. Others have run "round-the-clock" at our proving grounds. Others have undergone painstaking laboratory research. Now all this testing is completed and the Payhaulers are ready to roll. You owe it to yourself to check their features. Our test users did—and, as proof of outstanding Payhauler performance, a great many have placed their orders. Compare Payhaulers with your present hauling units to see what profit-making features you will get.



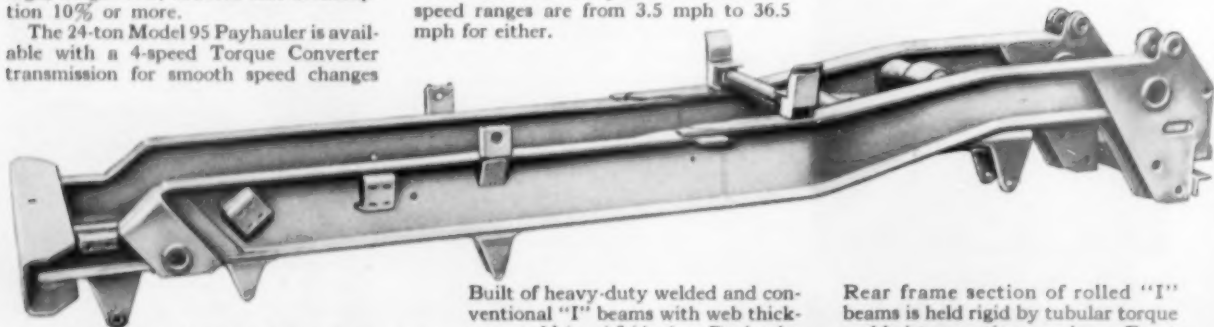
**TURBO-CHARGED DIESEL ENGINES—CHOICE OF TRANSMISSIONS**—Both the "65" and "95" Payhaulers have more horsepower per truck yard than any other truck in their size classes. The 24-ton, 16-yard "95" is powered by a 335 hp diesel...the 18-ton, 12-yard "65" is powered by 250 hp. Turbo-charging keeps power high, weight low, reduces fuel consumption 10% or more.

The 24-ton Model 95 Payhauler is available with a 4-speed Torque Converter transmission for smooth speed changes



from 4.8 to 38 mph. A lock-up clutch for direct drive performance and a Torqmatic brake system are standard with the Torqmatic transmission. Also available for the "95" Payhauler is a 9-speed transmission which provides an excellent range of speeds from 2.6 to 37.2.

In the Model 65 Payhauler you have a choice of a 5 or 10-speed transmission—speed ranges are from 3.5 mph to 36.5 mph for either.



**RUGGED, ALL-WELDED FRAME  
STRONGEST AVAILABLE—**

Built of heavy-duty welded and conventional "I" beams with web thicknesses of  $\frac{1}{2}$  and  $\frac{3}{4}$  inches, Payhauler main frames have the strongest known section modulus of *any* off-highway truck.

Rear frame section of rolled "I" beams is held rigid by tubular torque and hoist mounting members. Front frame members flex with shock loads through channel bumper torque member.



# Payhaulers®

- 250-335 HP Turbo-Charged Diesel Engines
- Rugged All-Welded Steel Frame
- Full-Floating Axles Planetary Drive
- Speeds to 38 MPH
- Power Shift Transmission



**ALL WELDED ROCK-RUGGED BODIES**—The Model 95 Payhauler shown is equipped with heated body. Quarry bodies available for both the Model 65 and 95 Payhaulers.



## INTERNATIONAL® Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

**A COMPLETE POWER PACKAGE INCLUDING:** Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

*Profitable trends in the use of refractories*

## Laclede's 5-Step Approach results in sound, economical refractory selection

The type of refractory most economical for your job is generally determined by five factors: (1) Degree of temperature, (2) Spalling, (3) Slag action, (4) Abrasion, and (5) Load.

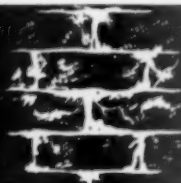
A periodic review of these factors frequently results in savings both in time and money. You may find that Laclede-Christy offers a particular type of refractory that substantially increases service life. Or you may find your heating conditions have changed—suggesting a change in refractories. Or you may have a special problem which Laclede's 5-Step Approach will help you solve.

Laclede offers many types and grades of refractories you may need. Assistance in the selection of the best and most economical type for your purpose is part of Laclede's specialized service.

Make profitable use of this service. Call your nearby Laclede representative.



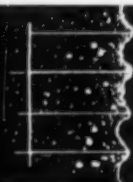
**1. Degree of Temperature**



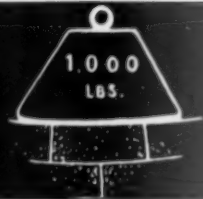
**2. Spalling**



**3. Slag Action**



**4. Abrasion**



**5. Load**

*Write for Laclede's Refractory Selection Guide.*



## LACLEDE-CHRISTY COMPANY DIVISION



**H. K. PORTER COMPANY, INC.**  
2000 Hampton Ave. • St. Louis 10, Missouri  
Mission 7-2400

6 Crane Carriers. The frame rails are heavy duty 8- x 12-in., 45-lb., wide flanged beams in the 8-ton unit and 12- x 12-in., 65-lb., wide flanged beams in the 10-ton carrier. The extra frame strength, together with a 10,000-lb. front driving axle, and a 28,000-lb. rear bogie, provide heavy duty operation. The carrier is powered by a 265 cu. in. Chrysler gasoline engine. Using a four-speed transmission and a dual range transfer case, the carrier has eight forward and two reverse speeds. It is equipped with 7.50 x 20, 8-ply tires. Optional equipment includes front and rear outriggers, rear fenders, power steering, heater and defroster, and 8.25 x 20 or 9.00 x 20, 10-ply tires.



### Fork Lift Truck

C. RINKIN & H. OLSON, 725 E. Huntington Drive, Monrovia, Calif., has announced the Rinson NF 60 fork lift truck, designed for heavy construction materials handling. It may be towed at highway truck speeds by a truck-type steering axle, built-in tow bar, safety chains, and a tie-in braking system. The forks tip back to become fender flaps, thus reducing overall length and providing additional roadability. The lift truck has an 8-in. ground clearance, and the steering is geared for maximum maneuverability with power steering available as optional equipment.

Powered by a 115-hp. Ford Industrial Engine, the unit is geared to four forward speeds and one reverse. Four wheel hydraulic braking is designed to exert equal braking force in both forward and reverse gears. All the wheels are interchangeable, and dual wheels may be installed on a standard axle. The lifting capacity of the lift truck is 4000 lb. on 24-in. load centers, lifting height is 104 in., and free lift is 14 in. The unit measures 118 in. in overall length, 58 in. wide, and 88 in. high.

### Tubeless Tires Added

CATERPILLAR TRACTOR CO., Peoria, Ill., has announced the addition of tubeless tires as standard equipment on its No. 12 and No. 112 motor graders. The tires are said to provide increased tire life because the lack of tube-tire friction permits them to run cooler. Blowouts are minimized because there is no tube to release air

all at once. Tubeless tires will also be furnished when optional tire sizes are ordered.



### Conveyor-Screen Plant

KOLMAN MANUFACTURING CO., Sioux Falls, S. D., has brought out the latest addition to its line of portable conveyors and vibrating screens. The Model 101 conveyor features a 42 in. wide belt, 50 ft. long, mounted on dual tires and which can be equipped with a line of accessories to comprise a complete portable conveyor-screen plant. The single deck vibrating screen is designed in proportion to the 42-in. plant, and is designated Model SB-90. It is 9 ft. long x 54 in. wide, and features the "Floating Action" characteristic of the Kolman single and multi-deck vibrating screens. The design eliminates excess weight, permitting suspension of the screening surface of over 40 sq. ft. without use of extra supports.

The plant can also be equipped with a double or triple deck screen if desired, and a variety of feeding accessories is available. In the above illustration, a Dozer Trap is being utilized to facilitate feeding with the dozer being used. From three to four crawler tractors with dozer blades were used in the pit shown here to feed the plant. Other features, such as operator's platform, head pulley clutch, back-stop, extended engine controls and rugged design, are included.



### Crane Swing Brake

LINK-BELT SPEEDER CORP., Cedar Rapids, Iowa, has announced a friction type swing brake on its complete line of crawler and rubber-tired shovel-cranes, in 1/2 to 3-cu. yd. digging capacities and 12 1/2 to 35-ton lifting

capacities. Particularly suitable for operations necessitating precision load spotting, the hydraulic control swing brake permits holding the boom in any desired position by fingertip control. On long boom operations, the friction type swing brake is particularly advantageous. Braking effort is hydraulically applied through "Speed-o-Matic" power hydraulic controls and spring release.



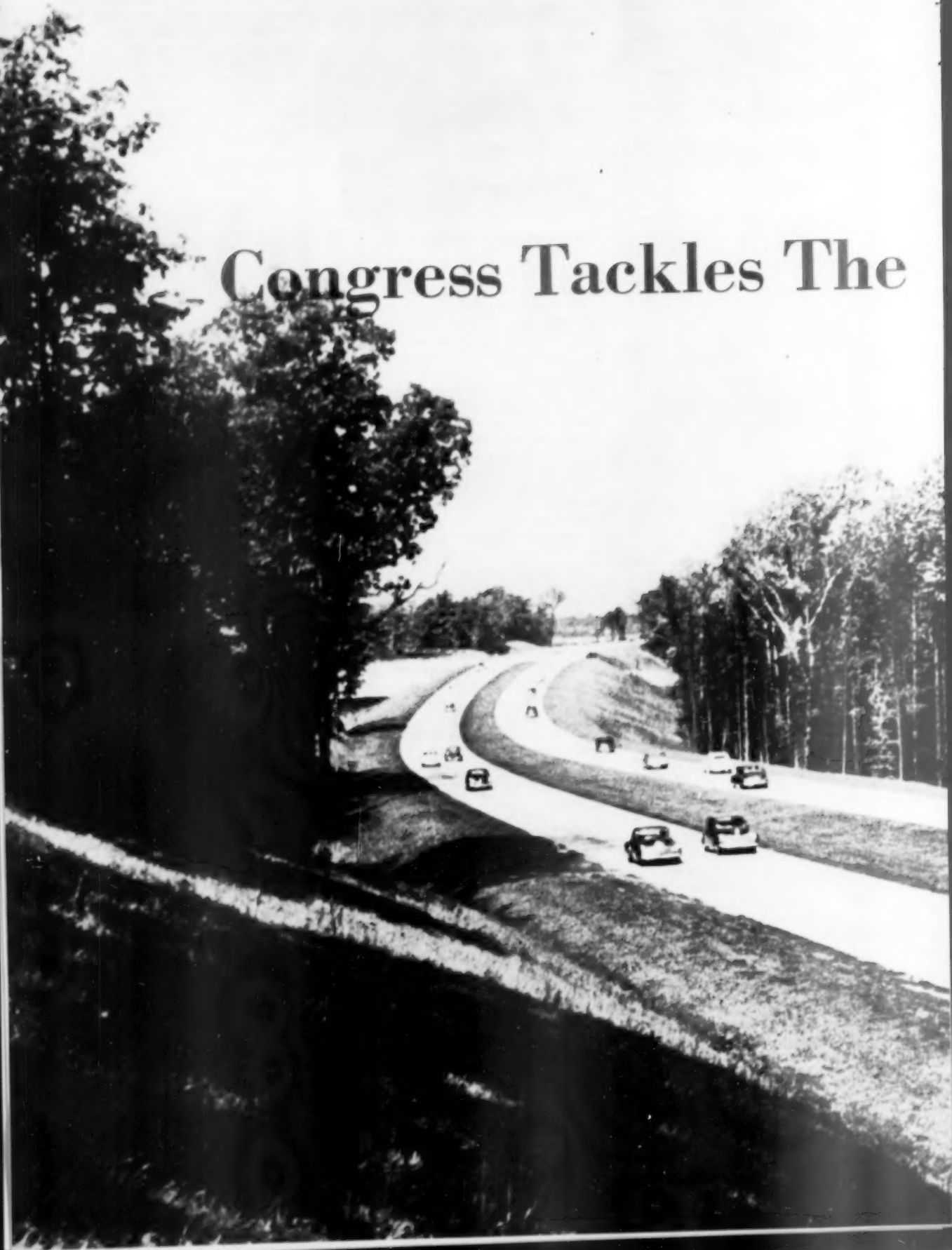
### Safety Air Gun

HYDRAULIC MANUFACTURING CO., Kiel, Wis., has announced a safety air gun for blowing dust or chips from work in progress. The gun, designated "Guardair," is designed to protect the operator's eyes, ears and face from flying chips of metal, etc., by the central air jet which is shot from the gun nozzle. A second jet of air, in the shape of a cone, is blown from the gun simultaneously to provide a protective shield or umbrella of high pressure which prevents debris from flying upward. The unit may be used in applications where air pressure is used for blowing work clean. The air line is attached to the gun handle, and operation is by a grip trigger for easier handling.

### Reinforced End Multiwall Bag

BEMIS BRO. BAG CO., 408 Pine St., St. Louis 2, Mo., has brought out a sewn multiwall paper shipping sack featuring reinforced end construction. The reinforcement consists of strips of kraft paper between plies at the bag's top and bottom, giving the effect of an extra ply at the points where most sewn multiwall bag breakage occurs. The bags, known as "Strength-end", are suitable for a variety of products, including cement, potash, salt and fertilizer.

# Congress Tackles The



By JOSEPH N. BELL

# Highway Bill

**Industry attention is glued to the \$51-billion 13-year road bill in Congress. This article tells what the proposed bill is, where it is now, and how its passage may affect future industry business**

**T**HE CONGRESS OF THE UNITED STATES is right now in the midst of mixing up a legislative potion that is going to (1) rejuvenate our sagging highway system and (2) go a long way toward making the rock products field a prosperous one indeed for many years to come.

We have become a nation on wheels. As the miles driven by American vehicles grow and grow, so, too, does the need for bigger, better and more modern highways. Thus, the rock products industries are tied in directly with one of the greatest industrial booms in history — the growth of the automobile as a necessity rather than a luxury in modern American living. The raw material from which to build the arteries for these cars must come from the rock products industries.

But before the roads can be built, there must be money to pay for them. That's where the Congress of the United States comes in, and for the past two years, Congressmen have been attempting to put together legislation to meet the great need for new and modern highways. The House of Representatives has at last produced and passed a bill that appears to have an excellent chance of becoming law.

Here are the answers to some vital questions about this new highway bill.

## **How did the huge federal highway expansion program begin?**

The need for a big program of highway improvement had existed in acute measure since our roads were neglected during World War II. This need grew as the number of automobiles and the weight of trucks also grew and took their toll on an antiquated highway system. There was —



and still is — a losing battle to gear roads to the growing need for them.

One of the original objectives in President Eisenhower's program was an adequate system of strategic highways in the United States. Three years ago he first proposed a multi-billion-dollar highway construction program. It was resisted by a sizeable group of state governors who wanted the federal government to take over financing of the Interstate System completely without state matching, or with a minimum of state matching. They wanted credit for funds spent by the states for Interstate System roads — public or toll. But the need was great, so resistance dwindled until the program finally was presented to Congress and action requested the past year.

#### What held it up?

From the beginning, the majority of Congress favored the idea of improving our highway system through increased federal aid. The hitch came in the method of raising the money. President Eisenhower wanted to finance the accelerated road-building through bonds outside the national debt limit. When this method of financing failed to win Congressional approval, highway legislation died in the 1955 session of Congress.

#### What are the major features of the present bill?

The Fallon Bill (put into the hopper by Rep. Fallon, D., Md.) is the result of a great deal of compromise, haggling and give-and-take. But in spite of all the debate on details, it has emerged as an effective highway measure. Its principal features include:

- A \$51.8 billion road-building program, to be spread over the next 13 years. About \$37.6 billion will be federal funds and the remainder supplied by the states.
- Expenditures of more than half of these funds will be on the "National System of Interstate and Defense Highways". The Interstate System is to be a 40,000-mile road network that connects most of our major population centers. It is expected to carry some 20 percent of the nation's traffic (but will make up only 1.2 percent of the nation's road mileage).

Of this system President Eisenhower recently said: "The importance of an interstate highway network is so clear and so widely recognized that it requires no elaboration. The country urgently needs an integrated network of safe, controlled-access highways to relieve existing congestion and to provide for the expected growth



Congressman George H. Fallon, Maryland, author of Federal Highway Act of 1956

of motor vehicle traffic. A modernized interstate system would also help to strengthen the nation's defenses and to reduce the toll of human life exacted each year in highway accidents."

The federal government will pay 90 percent of the cost of building or modernizing this Interstate System; the states will contribute 10 percent of the initial cost and will operate and maintain the network.

- The traditional 50-50 federal and state government outlay for other federal aid roads outside the Interstate System will continue and grow.
- Size-weight restrictions on trucks have been written into the bill and prevent the states from changing them under penalty of sacrificing their eligibility for their allotted share of Interstate System federal funds.

#### Where will the money come from?

The funds (\$38.5 billion) will be raised over a 16-year period from existing taxes plus these increases:

- Federal taxes on gasoline and other motor fuels raised from two to three cents a gallon;
- Tires and tubes taxed at eight cents a pound instead of five cents;
- Excises on trucks, buses and trailers raised from 8 percent of the manufacturers' price to 10 percent;

- Levy of \$1.50 per 1,000 lbs. on highway vehicles with a gross weight of more than 26,000 lbs.;
- New three cent a lb. tax on material used for retreading or recapping tires.

#### Where will it be spent?

Something more than half the money will be used on the 40,000-mile Interstate System; the remainder on federal-aid primary, secondary and urban roads within the states. The program will encompass every state in the Union plus the District of Columbia, Hawaii and Puerto Rico. It will provide a burgeoning highway construction market in thousands of localities throughout the country over an extended period of time.

#### Is there now any great opposition to the highway bill?

Like motherhood and Christmas, practically everyone loves highways. There is little opposition to doing something to satisfy the need for better roads. The controversies have arisen over the means of doing it. Most of these disputes have been compromised in the present Fallon Bill.

#### What is the present status of the Fallon Bill?

At this writing, the Fallon Bill has been approved by the House of Representatives. Action has been moved to the Senate, whose Committees on Public Works and Finance are hard at work on it. The former Committee already has substituted language of the Gore Bill (S. 1048) for Title I of the House Bill, except that the 13-year period of authorization for the Interstate System has been kept.

#### When would it become effective?

If provisions in the present bill are retained, both the construction and tax features would become effective July 1 of this year.

#### What are the principal problems still to be overcome?

Still in dispute in the Senate are provisions to:

- Reimburse the states for existing toll roads that can be incorporated in the Interstate System;
- Pay utilities 50 percent of relocation costs providing they don't exceed 2 percent of the total cost of the project;
- Regulate the labor pay scale on the federal-aid projects;
- Offer federal guarantees for state-issued bonds to finance roads, bridges or tunnels considered necessary for the Interstate System.

These disputed points — and others that may arise — will have to be de-

**Eastern gateway to  
241-mile long Ohio  
Turnpike**



bated and passed on in the Senate Committee.

**How does the immediate future of the bill look?**

Prospects for its fairly immediate passage still seem bright. Some of the principal problems listed are expected to evoke lively debate in the Senate Committees and in the entire body. But there is a feeling that a compromise can be made. The House showed ability to get together with bi-partisan spirit when it passed the Fallon Bill. Apparently, the Senate version, when passed, will go to conference in a Joint Committee of House and Senate before a final bill will be made available for the President's signature. There seems to be an urgency to pass the highway bill in this session.

**Will the Fallon Bill replace the regular federal-aid highway program?**

No. It will supplement it and expand it. The Fallon Bill promotes a gradual step-up in the regular federal-aid highway program, with a view of Congressional appropriation of \$11.4 billion for this purpose over the 13-year period of the bill. This money would be matched dollar-for-dollar by the states.

**What does the highway bonanza look like now?**

In addition to the \$51.8 billion 13-year federal program that probably will begin in July, big plans are afoot in the various states to rebuild their highway systems as follows:

—State roadbuilding contracts in

1956 are up some 20 percent over last year, with the greatest increase coming in the midwest:

—Roadbuilding equipment purchases will increase some 18 percent in 1956.

The answer here, of course, is self-evident. The federal and state governments are about to invest billions of dollars in your products. Seldom has an industry been presented such an unparalleled opportunity — as the rock products industries have today — to share in a program of immense public benefit while owning a virtual guarantee of a vast market for more than a decade to come. (In a subsequent issue, ROCK PRODUCTS will examine in detail precisely what the new road legislation means to the industries that make up its readership.)

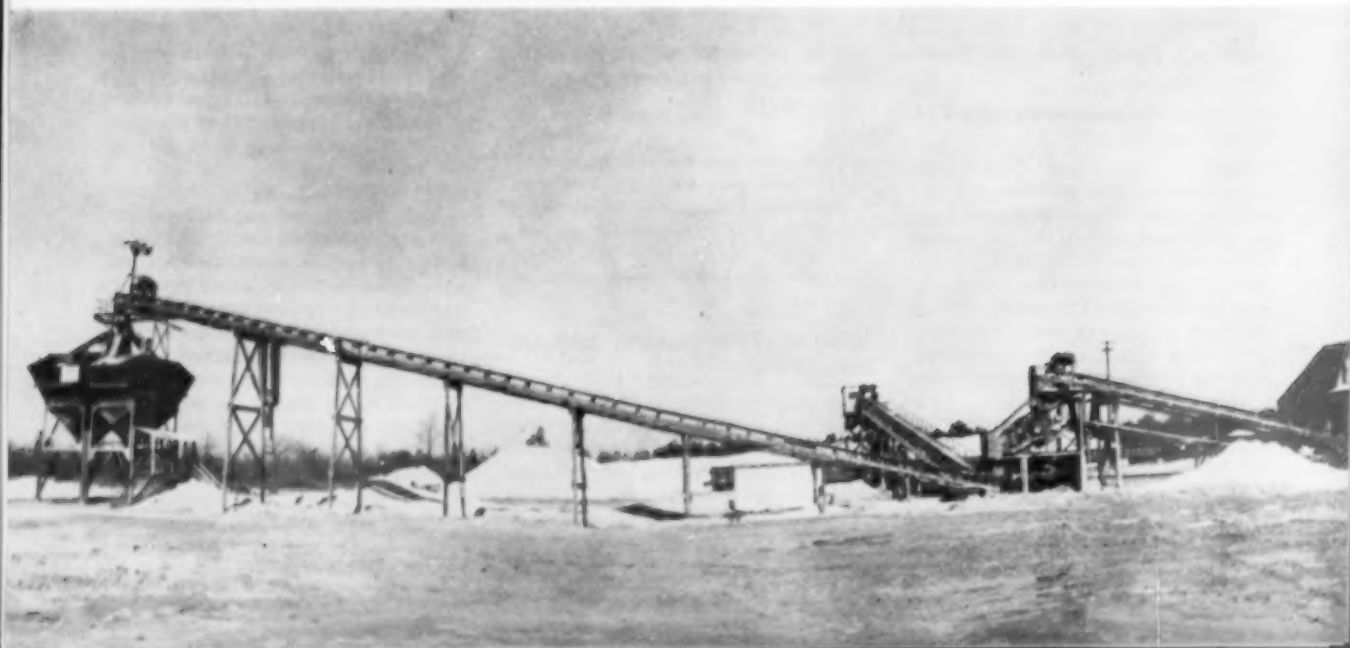
Two-Stage Scrubbing and Classifying in Sand and Gravel

# Quality Products From

High clay content was a problem at new Lillington, N. C. plant of Becker County Sand and Gravel Co. Clay is removed with primary and secondary scrubbers, sand screws and liquid cyclones. Featured are use of walking dragline and novel pit loading method

By WALTER B. LENHART

Screening section, to the right, with truck loading bin to the left



# A Clay Swamp

**N**O LESS THAN A HALF-DOZEN UNUSUAL PROBLEMS were met and solved successfully by Becker County Sand and Gravel Co. when their sand and gravel pit and plant were opened 40 miles south of Raleigh, N. C. The deposit itself is of a type not usual in the area where it is mined, for most aggregates in the Raleigh area have been crushed granite. Nature of the gravel deposit dictated use of novel methods and equipment in loading from the pit, haulage to the plant, and in processing the raw material. Common sense and practicability have been applied freely to the Becker operations at Lillington, with a result that a new source of quality sand and gravel has been made available to the central section of North Carolina.

**Loading in the pit** is by dragline into a specially built field hopper. Trans-

portation between pit and plant is by railroad car. In the plant, feed is processed by a rotary scrubber and attached rotary grizzly that makes preliminary separation of sand and gravel and separates clay balls for reject. Sand screws and liquid cyclones recover concrete and masons sand. Screening and crushing facilities in the gravel section of the plant are used to produce seven gravel sizes, three of which are crushed products.

**Discovery of the gravel** in the swamps at Lillington could be a story in itself. C. W. Gelder, formerly superintendent of the company's Fayetteville operations and now in charge at Lillington, said: "We started with a drill rig and kept prospecting until we found a commercial deposit." One would not suspect that gravel could be found at the location. The ground is flat and swampy, covered with thick brush and straggly trees. A sand-clay top soil appears to be much too heavy to make possible the economic removal of a gravel bed below it. The bed, believed to be glacial in origin, with the ice flow dumping its load of material in a shallow lake bed and then levelling off the entire terrain.

The gravel bed is about 15-ft. thick and carries 12 to 14 ft. of overburden.

**Stripping is done at night** with side casting of the overburden being practiced. A total of five pumps are used in the pit to keep it dewatered. These all pump to drain ditches and are only used when needed. The gravel is mostly minus 4-in. with an occasional man-size, angular, granite inclusion. A sizeable sticky, yellowish clay in the topsoil, and in the matrix itself, adds to the complexity and sets the Lillington operation apart and in a class by itself.

The new plant, which is about four miles south of Lillington, is served by the Norfolk and Southern railroad. To reach the deposit, the Becker County Sand and Gravel Co. built a 1½-mile standard gauge railroad, the plant being built near the deposit. Due to the swampy nature of the ground it was deemed inadvisable to use tractors or trucks for the primary haulage from the pit to the plant. A standard gauge railroad was built instead. In all, the company has about 2½ miles of standard gauge railroad.

Cars used for the primary haulage were salvaged from the Minnesota iron range. They are open hoppers, each holding 45 tons. The cars were remodeled, using Euclid single-hoppered bottom-dump gates and "wind-up" ratchet mechanism to provide for center dumping. Normally, three cars constitute a train-load, which is moved with a 44-ton General Electric diesel-electric locomotive. Length of haul varies from ⅓ to ½ mile.

**A most unusual pit loading system** is used at Lillington. A heavy steel portable field hopper, weighing 35 tons and holding 145 gross tons, receives material from the dragline in the pit. The hopper is covered with an inclined grizzly, which faces the loading slide. Discharge gates in the bin are air operated from remote positions, a small compressor supplying the necessary air.

Novel feature of this part of the operation is the method of moving the heavy field hopper, and of turning the entire unit around should it be desired to load on the opposite side of the track. Cars to be loaded pass directly under the hopper. When it is desired to move the field hopper parallel to the track, an open hopper similar to those used for hauling pit material is run under the bin. The open car is provided with four heavy, hydraulic, hand-operated jacks, one at each corner. When the car is under the bin, the top of the jacks engage four heavy steel "I" beams that form plates that are a part of the bin bottom. The jacks lift the entire bin, after which the locomotive hauls it to its new position.

Should it be desired to turn the field hopper to load on the opposite side, the special lift-car picks up the unit and hauls it to a point near the primary unloading hopper. A circular section of steel track has been built there on a concrete foundation. Diameter of the circular track is the same as the inscribed diameter of the four legs of the field hopper. When the hopper is over the circular track, four specially designed steel rollers placed under each leg are used to turn the 35-ton bin through an arc of 180 deg. The field hopper system is patterned





Walking dragline with 6½-cu. yd. bucket and 125-ft. boom excavates and loads field hopper. Train of hopper cars pulled by diesel-electric locomotive hauls material to plant

### MOTOR SCHEDULE

	HP	Type of Drive
Primary feed gate (Vertical)	10	Falk enclosed gears
Reciprocating feeder	20	Falk enclosed gears
No. 1 Belt	100	Falk enclosed gears
Scrubber-screen	30	Falk enclosed gears
Gravel scrubber	150	Jones herringbone speed reducer
Gravel belt (2)	40	Falk enclosed gears
Sand belt (3)	40	Link-Belt speed reducer
2 Eagle Iron Works sand screws	20	—
By-Pass conveyor (No. 4)	15	American speed reducer
Symons cone crusher	150	—
10-in. waste sand pump	150	Direct connected
Screen No. 1	20	—
Screen No. 2	20	—
Rinse Screen	15	—
Tunnel reclaiming belt	40	Falk enclosed gears
Car loading belt	40	Falk enclosed gears
Truck loading belt	50	—
One 8-in. water pump	125	—
One 8-in. water pump	125	—
Car puller	20	—
Four 3-in. pumps to dewater pit	—	—
One 6-in. pump to dewater pit	—	—
Three 4-in. Sand pumps on liquid cyclones	—	—
One 4-in. sand pump to dewater sump under No. 1 belt	—	—

after one in use at the Indianapolis, Ind., plant of the American Aggregates Co., and the Lillington hopper was built by the Indiana producer. The hopper is loaded by a No. 7200 Marion diesel dragline with a 6½-cu. yd. bucket suspended from a 125-ft. boom. A fuel and water tank is also a part of the field equipment. They are used to service the dragline.

The matrix as removed from the pit contains some clay balls *per se*, but the sand and gravel particles are coated so often with a wet, slippery clay that the material dumped to the primary hopper is of a soupy consistency. To cope with this unusual problem, the designers use a power-driven, vertical gate to control feed of the material to the 36-in. primary belt conveyor serving the plant. A reciprocating feeder also is installed under the track bin but it is used only on rare occasions. Both feeder devices are controlled by an operator whose station is at the unloading hopper. As the sticky material tends to adhere to the belt, water sprays are used to keep the return side clean. This water drains to a sump near the toe of the off-bearing belt. A 4-in. Georgia Iron Works slurry pump keeps the water level under control.

A second unusual feature is the use of a grizzly at the unloading hopper,

which is depressed about 3 ft. below the rails. This arrangement provides a sizeable pocket so that the three cars (145 tons) can dump immediately and not be held up by material piled on the grizzly.

Preliminary scrubbing and screening of sand and gravel are done in a 5-x24-ft. Lippmann rotary scrubber-screen. Fresh water is added at the scrubber. The discharge end of the rotary has been provided with a 4-in. opening grizzly that has been welded to the main assembly and revolves with the scrubber. Plus 4-in. material normally consists of granite fragments and clay balls. They fall to the ground and are pushed aside by one of two Caterpillar tractor-dozers that are available. The primary rotary scrubber is provided with an outer sand jacket.

Throughs from the 4-in. rotary grizzly (mostly in the 1 1/4- to minus 4-in. range) pass to an 8-x16-ft. McLanahan secondary rotary scrubber where more fresh water is added and the material gets a second scrubbing. That scrubber unloads to Belt No. 2 (gravel belt) that feeds the final screening section. Material retained by the outer screen of the rotary scrubber-screen by-passes the secondary scrubber and goes to the main gravel belt via a short belt.

The sand recovery system resembles in principle that used at the company's Marlboro, S. C., operation that was described in *ROCK PRODUCTS*, July, 1954, page 62, where liquid cyclones recovered the finer sand from the main sand recovery units. At Lillington, the throughs from the rotary

scrubber-screen's outer jacket are split to two 36-in. single-screw Eagle sand screws. The pool section of the Eagles has been enlarged (about doubled) to provide added settling area. Fines that settle in this pool are picked up by three 4-in. Georgia Iron Works slurry pumps operating in parallel and the pulp delivered to three 24-in. diameter Cottrell liquid cyclones. Outlets of the cyclones are provided with "molasses" gate valves, and fine sand from the recovery units is blended directly on the off-bearing sand belt that receives the main feed from the two Eagles.

As the deposit is high in sand, a flop-gate is used following the primary rotary screen to divert part of the sand pulp stream to a 10-in. direct-connected, sand pump. The material is pumped to waste. Concrete sand is the main sand item produced, but a small amount of masons sand is made at times either by a heavy wastage at the flop gate or by use of a finer screen on the rotary. Masons sand is scraped off the sand belt and recovered by conventional clamshell loaders. Concrete sand is stockpiled over a reclaiming tunnel. A third sand is also produced. This consists of fines from the crushed gravel section of the plant. Such sand is recovered by a small Eagle sand screw that receives its feed from the lower deck of the final gravel screens, and from the lower deck of the screen in the crushed gravel circuit. This sharp, relatively coarse and angular product is stockpiled alongside the concrete sand and over the reclaiming tunnel. It can be blend-

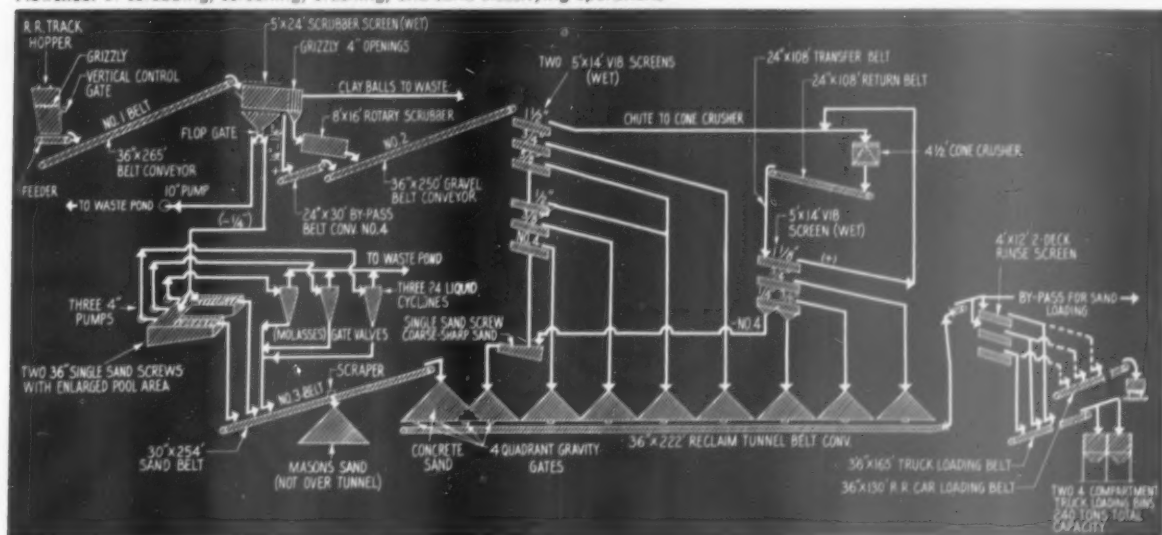


C. W. Gelder, superintendent, left, and Clayton Clark, plant foreman

ed with the main sand product on the reclaiming belt conveyor. There are three, quadrant, gravity-type gates under the concrete sand pile and one under the manufactured sand pile.

In the gravel plant, four sizes of natural gravel are produced. All are kept separate, but can be blended on the sand reclaiming belt conveyor that goes under the sand storage pile. The natural gravel sizes are: 1 1/8-in. to 3/4-in.; 3/4-in. to 1/2-in.; 1/2-in. to 3/8-in.; and 3/8-in. to No. 4. Crushed gravel sizes are: 1 1/8-in. to 3/4-in.; 3/4-in. to 3/8-in.; and 3/8-in. to No. 4. The plant produces 225 t.p.h. of finished coarse products and 100 t.p.h. of sand for a total of 325 t.p.h. All plus 1 1/2-in. stone is reduced in a 4 1/2-ft. standard Symons

Flowsheet of scrubbing, screening, crushing, and sand classifying operations





Sand screw recovers fines from crushed products

cone crusher that operates in closed circuit with the screen in the crushed gravel circuit. The cone receives its feed from a long, steeply inclined chute. The flow diagram gives the essentials.

A reclaiming belt delivers all products except sand to a 4-x12-ft. two-deck rinsing screen. Sand by-passes the rinse screen via a chute over its top. One belt conveyor from the rinse screen delivers to a car loading section, and a second belt supplies truck loading bins. There are two 4-compartment, company-made, steel truck bins equipped with 12-x12-in. quadrant-type gates. Final screening in the gravel and crushed gravel section is over three 5-x12-ft. Simplicity three-deck screens arranged as in the flow sheet.

Fresh water for the plant is pumped about one mile through spiral weld steel pipe that delivers to a canal that is about a mile long. A second pump delivers from canal to the plant. The pumps are 8-in. 2500-g.p.m. units powered by 125-hp. motors.

E. W. Hallett is president of the Becker County Sand and Gravel Co. with offices at Crosby, Minn. The southeastern offices are at Cheraw, S. C., where the company recently built a new and modern office building. E. A. Mullen is executive vice-president and M. C. Evans is vice-president in charge of production. W. E. Williams is secretary-sales manager. Leon Gardner is chief engineer. C. W. Gelder is superintendent at Lillington and Clayton Clark is plant foreman.

A 36-in. belt conveyor from track hopper carries material to plant



## Gypsum Safety Record

AWARDS WERE PRESENTED to winners in safety contests conducted during 1955 in 50 gypsum plants throughout the country, at the annual meeting of the Gypsum Association, April 25-26, 1956, at the Drake Hotel, Chicago.

The United States Gypsum Co. plant at Fort Dodge, Iowa, won the trophy in Class A, which comprises plants where 725,000 or more man-hours were worked in a 12-month period, with a rating of 1.67 lost-time injuries. Among Class B plants, 542,000 to 725,000 man-hours, United States Gypsum's plant at Philadelphia, Penn., won with a 1.39 rating.

Nine plants, two in Class C (290,-

000 to 542,000 man-hours) and seven in Class D (less than 290,000 man-hours), reported no lost-time accidents for the year. The Sigurd, Utah, plant of Certain-teed Products Corp., won the Class C trophy for the third straight year, with a record of over 2,000,000 man-hours without a single lost-time accident. In this group, the Heath, Mont., plant of U. S. Gypsum Co., also had an accident-free record.

Winner among the Class D plants was U. S. Gypsum Co.'s plant at Sigurd, Utah. Also with perfect records were U. S. Gypsum plants at Milwaukee, Wis., and Grand Rapids, Mich.; Celotex Corp. plants at Fort Dodge, Iowa; Kaiser Gypsum's plant at Redwood City, Calif.; and Ideal Cement Co.'s plants at Portland, Colo., and Hanover, Mont.

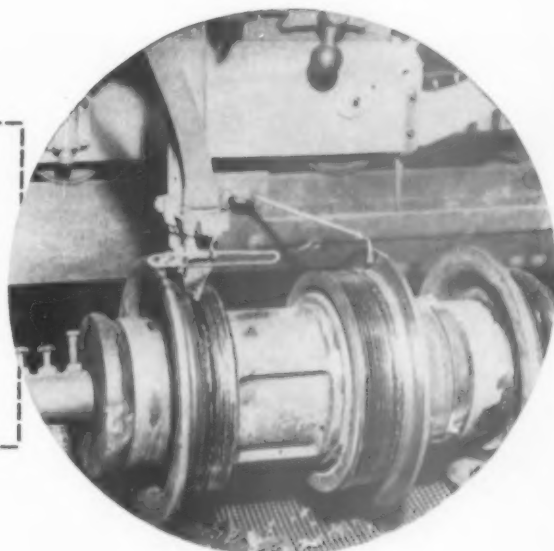
A trophy was also presented to Certain-teed's Class B plant in Akron, N. Y., for having made the most notable progress in accident-prevention. This plant reduced its accident-frequency rate from 18.7 and 36.8 in 1953 and 1954 to 1.71 in 1955.

The gypsum industry has improved its safety record approximately 375 percent over the last 12 years, according to Lloyd H. Yeager, association general manager. Despite a 100 percent increase in man-hours worked, he reported, there were only about half as many lost-time accidents in gypsum plants, mines and quarries during 1955 as in 1943, when an industry-wide accident-prevention program was introduced.

## Moves General Office

ALLENTOWN PORTLAND CEMENT Co., Allentown, Penn., has moved its general office to Seventh Street at Thruway in Allentown, Penn.

## Does it pay to **REBUILD TRACTOR ROLLERS?**



*here's one answer...*

**This is a report from one of the country's largest tractor maintenance shops having complete facilities for crawler reconditioning. It particularly concerns rebuilt track rollers, a major item of wear. In this shop rollers are regularly rebuilt and hard-faced by the automatic electric welding process, using Stoodly 105 on the running surface and flange.**

About a year ago a tractor came into the shop for overhaul. The rollers were badly worn; those found suitable for rebuilding were returned to size with Stoodly 105 and the internal assemblies thoroughly reconditioned. The balance of the rollers were discarded and replaced with standard parts. Following routine procedure, the shop foreman checked the entire crawler assembly to insure proper alignment—a highly important factor in reducing needless wear. After 2500 hours this tractor came in again for its customary overhaul. Inspection of the rollers disclosed the following:

**The standard rollers, without exception, were worn from  $\frac{3}{8}$ " to  $\frac{1}{2}$ " on the running faces; in all cases the internal assemblies required several replacement parts.**

**Hard-faced rollers showed negligible wear on running surfaces and the only replacements needed were new seals for internal assembly.**

It is of course an accepted fact that rollers rebuilt and hard-faced with Stoodly 105 by the automatic method give a service life considerably beyond that of standard replacements—at a much lower cost. The hard-faced roller with its superior abrasion resistance reduces uneven wear on the track rails by providing a smooth,

even working surface that allows free movement of the rails and resists grooving of the roller. Hence, wear on the internal roller assembly is also decreased.

*Stoodly 105, the alloy used in this application, was the first automatic wire of its type and is today the alloy generally preferred by principal shops. It has been proven by eight years of actual field use—assurance of maximum service life at reasonable cost.*

Earth-moving contractors operating large fleets of tractors, shovels, buckets and crushing plants often find the installation of an automatic welding head a profitable investment for rebuilding rollers, idlers, house rolls, crusher rolls and similar wearing parts. Many contractors, however, prefer to send such work to a thoroughly equipped automatic job welding shop of which there are a number located throughout the country. *A list of these job shops is available on request.*

Complete information on automatic hard-facing installations and procedures will gladly be supplied—without obligation. You may consult your local Stoodly dealer—see the "yellow pages" of your phone book under "Welding Equipment and Supplies"—or write direct.

**STOODY COMPANY**

11929 East Slauson Avenue, Whittier, California



Compact 225 t.p.h. crushing and screening plant, showing screening tower and bins, to the left, and primary crusher, to the right

## HEATED SCREENS

### Step Up Production of Fine Sizes

#### MULTIPLE CONTROL

... stations at modern plant of Miami River Quarries, Inc., Sidney, Ohio permit shutting down widely separated equipment from remote points in emergencies

By KENNETH A. GUTSCHICK

**D**URING THE FALL OF 1955, MIAMI RIVER QUARRIES, INC., Sidney, Ohio, a new quarrying firm, started up a 225 t.p.h. plant and quarry located about five miles south of Sidney. The plant, built at a cost of approximately \$250,000, features a simplified flow sheet which incorporates a primary crushing station, a screening tower, and a secondary crusher closed-circuited to one of three vibrating screens. Finished products range from 3-in. top size down to and including agricultural limestone. Production of the finer sizes is facilitated by means of an electric heater mounted on one of the screens.

The operation is located on a 115-acre farm site along the Great Miami River near the town of Kirkwood. In opening the new plant, the company turned back the pages of history to as early as 1869, when the former Pontiac Quarries Co. operated a quarry and lime kiln within a few hundred feet of the present quarry. At that time, the various Pontiac products were shipped via barge on the then important Miami-Erie canal, which roughly paralleled the Great Miami River. Remains of the post-Civil War operation are practically non-existent today, and in its place a modern stone plant has taken over. The barge canal is no

longer in use, and all shipments are via truck, although rail transportation is anticipated in the future.

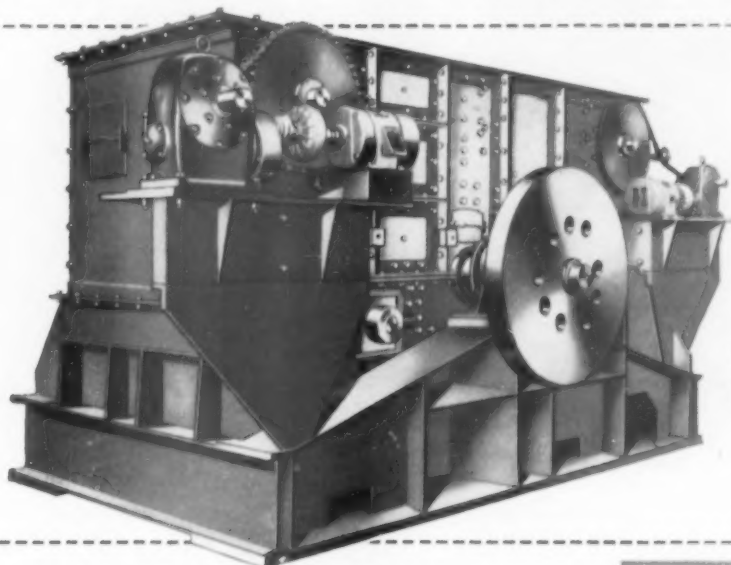
#### Quarry Features

Like many western Ohio quarries, the Sidney quarry is developed in the Niagaran dolomite, and the present face is 28 ft. The dolomite in the uppermost formation is thin bedded, brown to buff-colored, and consists of about 90 percent calcium and magnesium carbonates. The lower dolomite, called the Cedarville formation, is more massive, bluish-gray, and contains 7 percent silica. Stone from the

*(Continued on page 90)*

WET, STICKY MATERIAL CAN'T CLOG A

# Bulldog Hammermill



NC  
Non-clog

## Traveling Breaker Plate keeps production going, hour after hour

Regardless of moisture, a BULLDOG NON-CLOG HAMMERMILL keeps your crushing operation going without clogging or jamming. Traveling breaker plate eliminates build up of material in breaking chamber . . . moving cleaning bar keeps discharge free at all times. You get steady hour after hour tonnage with no costly downtime.

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ations choose a BULLDOG. Get a mill that has been designed, engineered and produced by hammermill specialists who have been doing the job better for 35 years. Every BULLDOG HAMMERMILL is "Engineered to your job" for greater output with less horsepower, longer hammer life, minimum maintenance. If you want to make better use of hammermills in your operations . . . consult our engineers. Tell us your crushing problems now.

### The Bulldog Hammermill Line

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- Non-Clog Moving Breaker Plate Hammermills for Wet Materials
- Stationary Breaker Plate Hammermills for Dry Materials.

For secondary crushing and  
Fine Reduction

- Center Feed Hammermills

Capacities 1 to 1000 tons per hour

### Recommended for

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Co.



Looking toward primary crusher station with 30-in. main belt conveyor inclining up from base of crusher and the 24-in. belt conveyor, to the left, from secondary crusher



All-steel screening tower incorporating two 4- x 12-ft. and one heated 3- x 6-ft. screen. Total bin capacity is 180 tons with convenient facilities for loading trucks

entire face is excellent for both construction aggregates and agstone.

The company will produce fluxstone in the near future, in the Brassfield limestone vein immediately underlying the Niagara dolomite at the quarry site. This Brassfield formation, consisting primarily of high calcium limestone, is already a major source of fluxstone for the southwestern Ohio steel industry. Future plans call for deepening the quarry and working the Brassfield as a separate bench. The

presence of high calcium limestone at a relatively shallow depth was a principal factor affecting selection of the quarry site.

Overburden, varying from 0 to 5 ft. at the quarry, is removed by shovel and bulldozer. Drilling is handled on contract with a Joy 225 rotary drill, putting down 5½-in. holes. A 10- x 12-ft. drilling pattern is used, and as many as 60 holes, in three or four rows, are shot at a time. King 5-in. explosives are used, with 40 percent

gelatin at the bottom and Detonite in the deck loading. Millisecond delay caps detonate the shot.

Quarry loading is handled with a Lima 604 shovel, carrying a 1½-cu. yd. Amsco bucket and powered by a G.M.C. 671 diesel engine. Two White WB28 trucks fitted with 10-cu. yd. Galion quarry bodies haul to the plant. Access to the primary crusher is via a ramp supported by cribbing.

#### Crushing and Screening

Stone is dumped into a 20 ton loading hopper mounted over a 42-in. x 12-ft. heavy duty pan feeder and fed to a 3642 Kennedy-Van Saun overhead eccentric jaw crusher. An important feature is that the feed can be closely controlled from 0 up to 225 t.p.h. by means of a 10-hp. Reeves Varispeed drive on the feeder. The crusher, set with a 3½-in. opening, is driven through Gates V-belts by a 150-hp., 900 r.p.m. Crocker-Wheeler motor. To prevent overloading, the motor has two-stage starting. The crusher product is delivered to a 50-ft. high screening tower by a 30-in. inclined belt conveyor, 145-ft. centers; this conveyor is driven by a 30-hp. motor through a Dodge Torque-arm reducer.

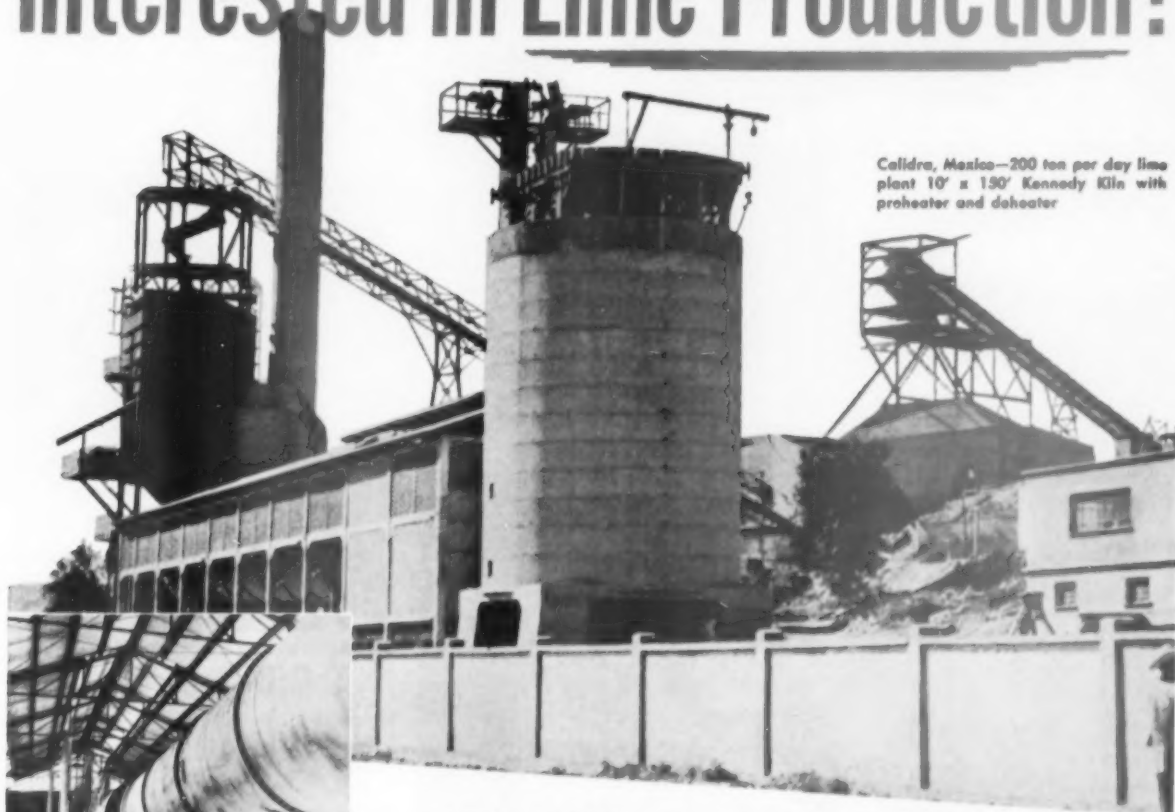
The screening tower, on all-steel structure, incorporates three suspension-mounted Kennedy Van-Saun type AAA vibrating screens and six 30-ton

(Continued on page 92)



View of quarry, showing stone formation. Fractured, up-arched strata, on left, was caused by open-up blast. A 1½-cu. yd. shovel is loading a 10-ton truck

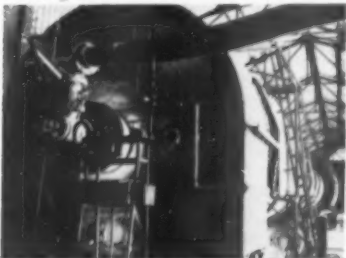
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Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with preheater and deheater



Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with oil pre-heating coils looking towards firing end



Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with oil burner



Calidra, Mexico—200 ton per day lime plant 10' x 150' Kennedy Kiln with preheater and deheater

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252 Wall Street, New York 5, New York

## HEATED SCREENS

(Continued from page 90)

truck loading bins. The top screen is a 4- x 12-ft. triple deck unit, having decks with the following openings: top—two sections of 2½ in. and one section of 3½ in., middle two sections of 1½ in. and one section of 1¼ in., and bottom—two sections of 1¼ in. and



Ralph W. Kerr, president, left, and W. C. Reiff, superintendent

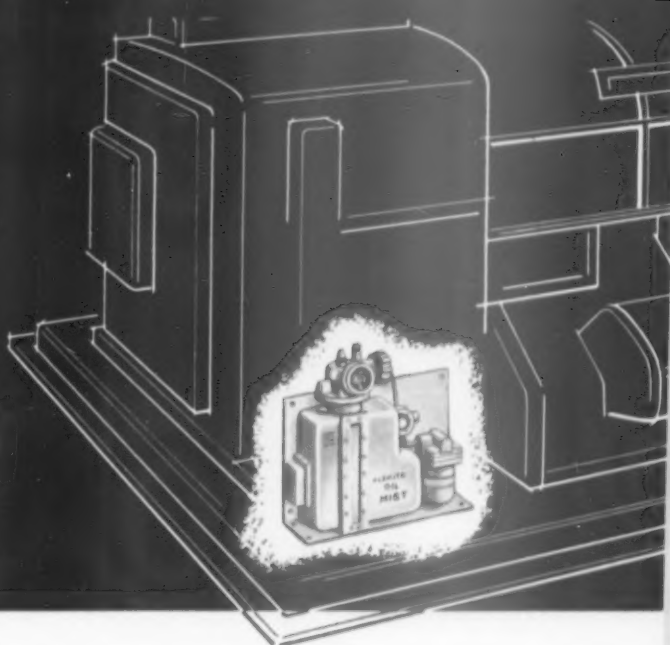
one section of ¾ in. The middle screen, a 4- x 12-ft. double-deck unit, has two sections with 1½-in. openings and one section with ½ in. on the top deck and ¾ in. on the bottom deck. The bottom screen is a 3- x 6-ft. single deck unit having 10-mesh stainless steel wire cloth; it is fitted with a Hannon 4015SP electric screen heater, operating on 440-volt, 60-cycle current. Four 48-in. flat braided cables distribute power to the screen deck, heating the wire cloth sufficiently to prevent blinding. The temperature can be closely regulated according to the temperature and wetness of the feed and other factors by means of a rheostat. This screen has a capacity of about 8 t.p.h., and produces high quality materials.

The top screen serves partly as a scalper, rejecting the top deck product to the secondary crusher; and when there is a large demand for the finer sizes, material off the two other decks can also be recrushed. Normally six basic sizes are produced—two to a screen, including Ohio No. 12 and No. 3 stone on the top screen, No. 4 and No. 6 on the middle unit, and No. 9 and minus 10-mesh agstone on the heated screen. These products are gravity fed to the bins. In addition, blended products such as Ohio No. 46, crusher run, etc., can be produced by throwing flop gates in the discharge chutes. In the case of crusher run road base stone, only the top screen is used, and the product is made through the bottom deck.

Secondary crushing is handled by a 38½-in. Kennedy Van Saun gearless gyratory unit which is V-belt driven

(Continued on page 168)

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...boosts machine output in almost every industry!**

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- 3. Elimination of Guesswork**—No bearing can be over-looked, nor over-lubricated! Every bearing picks up only as much Oil-Mist as it needs.
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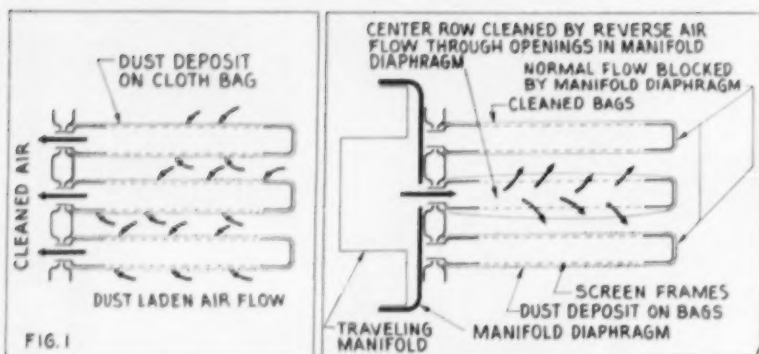


Fig. 1: To the left is a diagram showing action of cloth screen dust collector and to the right is a diagram showing cleaning action of manifold

## Continuous Self-Cleaning DUST COLLECTION

By W. O. VEDDER\*

INCREASING CONSIDERATION is being given today to continuous dust removal from the cloth surfaces of dust collectors by reversing the air flow. This is especially true when the plant is utterly dependent on the proper operation of the dust control system, when dust loads are heavy, when three-shift operation is required, and when the process is continuous.

With intermittent cleaning, the entire system is shut down and all bags are cleaned at once. The continuous system employs a manifold with integral blower which travels constantly inside the collector from screen to screen, cleaning each vertical row separately free of dust by reversing the flow of air. As shown in Fig. 1, three vertical rows at a time are out of service.

With intermittent cleaning, the air flow through the system decreases as the dust pack on the cloth surfaces builds up. Just after the bags are cleaned, for example, the air flow is higher than normal but after a period of operation, the air flow may be substantially decreased. With continuous cleaning, the air flow is uniform since the collector resistance is constant.

Before the development of continuous cleaning, adequate dust control on a continuous basis was achieved by installing multiple section collectors to permit alternate shut-down of sections for cleaning while the other section or

sections carried the air and dust load. This resulted in a substantial increase in cost and frequent fluctuation in air flow because of variation in filtering area. Larger space was also required for this operation.

In addition, intermittent cleaning is dependent on the human factor. Persons may forget to start the cloth cleaning mechanism, may forget to shut it off, may not continue cleaning for the correct interval and may forget to restart the fan.

### Convert to Continuous Collection

Many operators of certain modern types of intermittent dust control systems are finding it economical to convert existing equipment to continuous collection. Conversion is suggested where the dust load has increased, longer hours of plant operation have taxed the capacity of existing equipment or the process has been changed from intermittent to continuous.

Continuous dust control and collection is used in many rock products industries, particularly those which use continuous processes. A large processor of silica uses a self-cleaning, continuous collector to control dangerous particles inside the plant which necessitated the wearing of respirators by employees before the installation of the dust control system. Dust exhausted to the outdoors decreased visibility in the area, covered vegetation and homes with a deposit of dust and caused serious community relations problems.

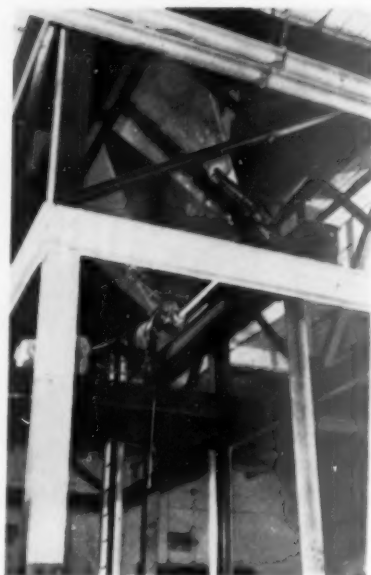


Fig. 2: Collected mica and talc dust falls into hoppers and is discharged through rotary valves into the screw conveyor to the drop pipe for bagging

The continuous control system has eliminated the respirators and increased worker morale and productivity. The community problems are improved and plant housekeeping and maintenance costs have decreased. The load is heavy. In this plant, about 400 tons per day of material is processed which produces 4 tons of dust collected by the Pangborn units. The dust is sold as silica flour. Because the process is continuous, it is impractical to shut down an entire series of integrated machines for cleaning of the cloth in the collector.

### Portland Cement Productive Capacity

NEW FACILITIES providing plant capacity to produce 17 million additional barrels of portland cement were completed during 1955, according to *Construction Review*. During 1956, capacity will be increased to produce another 46 million bbl., when projected new plants and additions to existing plants, are completed. By the end of 1956, the industry should have a total annual capacity of about 358,000,000 bbl.

The expanded capacity was prompted by the expected increased demand, particularly the prospect of a greatly expanded highway construction program. Potential capacity at the end of 1955 exceeded 311 million bbl., about 30 percent more than in 1946, and the industry was operated close to rated capacity in 1955, compared with only about two-thirds of rated capacity in 1946.

\*Manager, dust control department, Pangborn Corp., Hagerstown, Md.

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ROCK PRODUCTS, June, 1956

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# TRIEF Cement

## How Scotland Uses It to Build Dams

By SPECIAL CORRESPONDENT

### SLAG SLURRY

... blended with portland cement and mixed with aggregates produces the concrete for Glen Moriston dams

**S**ELDOM HAS A NEW PROCESS caused so much speculation on its possibilities in British industry as that known as the Trief cement process. It was introduced for the first time in Great Britain for building of two dams at Glen Moriston by the North of Scotland Hydro-Electric Board. A new cement plant for producing the material was built at Moriston. The main contractors were the Mitchell Engineering Group of London.

The introduction of Trief cement to Great Britain with the Glen Moriston dam scheme has been hailed rightly as an important new advance in concrete construction — particularly where large quantities of concrete are involved. Basically, Trief is a cementitious slag pioneered by Monsieur Victor Trief, a Belgian. It was first used on a large scale on the Bort dam in France.

In the Trief process, the granulated slag is not mixed with portland cement clinker before grinding. It is ground wet in a ball or tube mill, the resultant slurry product being added directly to the concrete mix. It may be dried and stored for future use. By grinding in

the presence of water a much finer product can be obtained than is possible with dry grinding (the only method available for mixtures with portland cement clinker). This method also shows a considerable saving of power.

The finely ground slag has latent cementitious properties. It can be kept indefinitely when dry, and for several weeks when in the slurry state. It will not harden or set until activated by an alkali (for which purpose lime may be used). As there is free lime in portland cement, this latter can be used with advantage as an activating agent.

In brief, some of the advantages claimed for Trief are as follows:

1. The wet-grinding is effected at a much less power cost than dry, and at the same time much finer grinding is possible.

2. When grinding slag and cement clinker together, the slag is not ground so finely as the cement. In practice, it is desirable that the slag should be the finer. By grinding the slag separately and by the wet process, the slag can be ground to a fineness that is difficult to attain by dry grinding.

3. The fine grinding of the slag gives

a greater activity to the cement during the initial stages of hardening. Thus, one of the disadvantages of the use of the metallurgical cements is overcome.

4. When making metallurgical cements, pre-drying of the slag is essential. With the Trief process, if the slurry can be used where manufactured, this cost of drying does not have to be met.

5. The great fineness of the ground slag augments the retentive power for water, which is strongly absorbed at the surface of the numerous fine grains.

6. As the slurry will not set without the addition of an activator, it can be kept for a considerable period without deterioration.

7. Concrete made with Trief cement withstands alternations of frost and thaw successfully.

8. Owing to the fine milling, a dense impermeable concrete is formed. Further, with practically no free or feebly combined lime, it has a much greater resistance to aggressive water.

9. Concrete made with Trief cement is more workable and is easily placed by ramming or vibrating.

10. It has greater atmospheric re-

Fig. 1: Elevation details showing how ground slag is prepared as a slurry

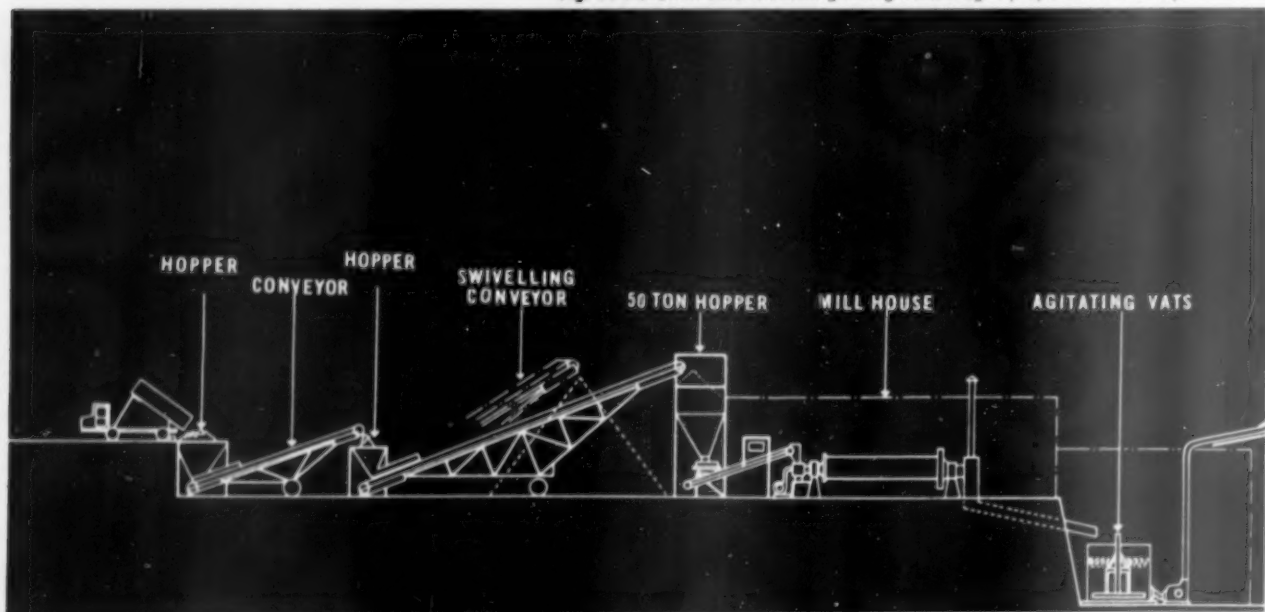




Fig. 2: Layout of quarry, slag slurry mills and tanks, and batching plant with relation to Moriston Dam project

distance than dry-ground cement due to fineness of grinding.

11. The volume shrinkage is less than that of concretes made with ordinary cements.

12. Its strength is comparable with that of concrete made with the best super-cements.

A Trief cement plant, large and elaborate, has been set up at the Cluanie dam site to provide Trief cement for the Glen Moriston scheme. Close to the plant is a laboratory where extensive tests are made continuously to satisfy the consultants and the Board

of the quality of the cement.

The slag, which has been specially selected for its chemical qualities, is brought by truck and trailer from Colville's steel works at Glasgow. The maximum daily intake of the mills at present is about 170 tons, but there is ample storage space nearby for excess slag. On arrival at the site, the cars dump slag into a small hopper feeding on to a portable conveyor, which carries the material either into one of the two hoppers at the mill house or to store.

In the mill house, Fig. 1, a rotary

plate feeder delivers slag to a conveyor or belt which has a weigh meter on it, so that the material is weighed before entering the mill. There are two 5- x 28-ft. mills, each driven by a 275-hp. motor. Each mill will grind  $3\frac{1}{2}$ — $3\frac{3}{4}$  tons of slag an hour to the required fineness. The Trief process is a wet grinding process, and the resultant slurry is maintained at about 30 percent water content. Slurry from the mills has a fine creamy consistency. It is allowed to run down through sloping launders and is collected in tanks, which are provided with stirring

Fig. 1-A: Slag slurry is pumped to a batcher plant where it is mixed with portland cement to form Trief cement which is mixed with aggregates to supply concrete for dam

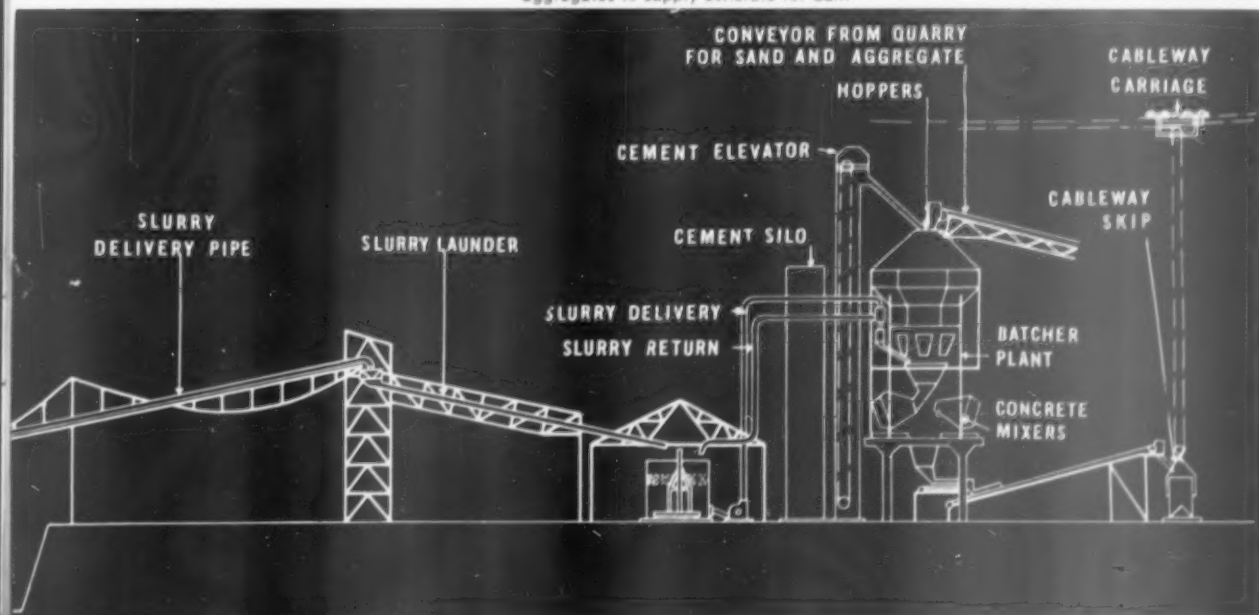




Fig. 3: Map showing location of dams for Scotland's Moriston hydro-electric project

gear and compressed air to keep the slurry consistently agitated. The mixing or blending tanks are 14 ft. in diameter, 13 ft. high, and stand about 20 ft. lower than the mills.

The batching plant is some distance away from the mills and mixing tanks, due to the inconsistencies of the terrain at Moriston. To reach it the slurry has to be pumped in steel pipes for about 200 ft. Special slurry pumps are used for this purpose. To keep the pipes clean when the pumps are not working, an ingenious scheme of blowing a rubber ball through the pipe has been applied.

Slurry from the end of the pipes is fed to another set of tanks near the batching plant. Here, the slurry again is kept in an agitated state. These tanks, together with the mill tanks, form a storage for a total of some 200 tons of material. Slurry is pumped to the top of the batching plant into a small steady head or surge tank. A return is taken from the bottom of the steady head tank to the tanks near the batching plant so that the slurry is kept in continual circulation to prevent settling.

All material required for the concrete (the slurry, portland cement, sand and the aggregate from the quarry) are then weigh-batched in the correct proportions for the mixer. After mixing, the concrete is moved by conveyors to receiving hoppers that feed concrete skips carried by cableways.

**Tests of concrete,** Fig. 1B, made with Trief cement are conducted at the laboratory of Moriston. Every facility

for checking the fineness of the Trief powder by all the various international standards is available at the Moriston lab.

The slag is tested by ultra-violet rays in order to check whether it is vitreous or crystalline. Photo-electric cells are used for estimating particle size. The particles also are measured with a microscope. All this work is supported by daily mortar tests for compressive strength by the methods laid down by the BSI. Samples of concrete as laid on the site also are checked to the same standards.

As an additional check, samples of Trief and portland are both being tested for corrosion in peaty waters on the site. The results of resident engineer's tests on November 6, 1953 were:

Class of Concrete	Density lb./cu. ft. Days				Comp. Strength p.s.i. Days				Spec. Comp. Strength p.s.i. Days	
	3	7	14	28	3	7	14	28	7	28
D1 1-7	150.7	151.9	—	—	1540	2732	—	—	1600	—
4D 1-7	—	149	—	—	—	2240	—	—	1600	—

The experimental figures to November 6, 1953 were:

Class of Concrete	Density lb./cu. ft. Days				Comp. Strength p.s.i. Days				Spec. Comp. Strength p.s.i. Days	
	3	7	14	28	3	7	14	28	7	28
4D 1-7	—	152	152	152.8	—	2800	3080	3900	1600	2250
4D 1-7	153	153	153.7	—	1610	2640	3280	—	1600	2250

The progress that has been made up to the time of publication at the principal works connected with the Moriston scheme is given by name of project:

Cluanie dam: excavation nearly complete; concreting started.

Loyne dam: Excavation under way.

Loyne tunnel (from Loyne to Loch Cluanie): tunnel driving complete.

Ceannacroc tunnel (from Loch Cluanie to the surge shaft): major portion of tunnel driving completed.

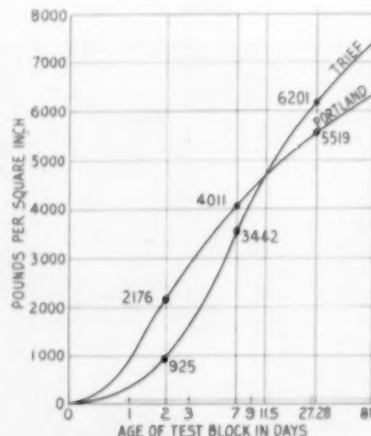


Fig. 1-B: Curves showing relative strength of concrete made from portland cement and concrete made from a Trief mixture at various ages

Doe tunnel (carrying water from Doe weir on the Allt nam Peathrain): tunnel driving complete.

Doe weir: work commenced.

Ceannacroc generating station: excavation about fifty percent complete.

Access and trailrace tunnels: tunnel driving complete.

Surge shaft: excavation complete.

High pressure shaft from Ceannacroc tunnel to high pressure tunnels, leading to turbines: excavation under way.

Temporary diversion road at Cluanie dam: complete.

Access road at Loyne dam: complete.

**A report on the Moriston Dam scheme** is included in the following description, which is taken from the North of Scotland Hydro-Electric

Board's official progress report on the Moriston scheme.

"The North of Scotland Hydro-Electric Board's scheme for harnessing the waters of the River Moriston and its tributary the River Loyne will produce 213 million units of electricity a year, and will have a capacity of 65,000 kw.

"There will be two large dams, one at the outlet of Loch Loyne and one at the outlet of Loch Cluanie. A tunnel will convey the water from Loch Loyne to Loch Cluanie and another tunnel will convey the water of both lakes to a power station at Ceannacroc. There will also be a further large power station, dam and tunnel in lower Glen Moriston and subsidiary power developments, as indicated on the map, Fig. 3, on the River Doe and at Livishie.

"The most important and original feature of the works is the use for the first time in Great Britain of wet-ground blast furnace slag by the Trief process in substitution for a considerable proportion of portland cement in the concrete of the dam. It is estimated that about 20,000 tons of portland cement will be saved by this means and thus freed for export and other home uses. The Trief process uses blast furnace slag which is at present virtually a waste product.

(Continued on page 170)

**Now —**

**to meet modern cement mill production demands**

## **REX RATED**

### **Centrifugal Discharge Bucket Elevators**

#### **First really new concept of elevator design in years!**

The Rex Rated Centrifugal Discharge Bucket Elevator is a new approach to elevator design and operation — the result of exhaustive engineering research and field testing. Specifically designed for heavier loads, bigger capacity, longer operating hours — designed to meet the increased production demands of modern mill operations.

#### **Balanced design is the secret**

Rex Rated Bucket Elevators are designed around a sound engineering concept — Balanced Design. First, each part of the elevator is balanced against other parts for maximum operating efficiency, strength, durability. Next, these balanced components are combined to form an elevator that is matched against the exacting, tough requirements of cement mill operation. The elevator is fitted to the job — not only to fill the needs of today's heavier production schedules, but to meet the requirements of future, larger production schedules. Balanced design gives you balanced performance!

#### **Greater capacity**

One feature of Rex Rated Centrifugal Discharge Elevators is increased capacity. In fact, they more than meet the needs of closed-circuit grinding systems.

A hooded bucket and balanced chain design permit closer spacing of larger buckets. These elevators actually overlap the capacities of super-capacity elevators, while retaining the advantages of economy and dependability.

#### **Most economical method for elevating materials**

Compared to other elevating methods, Rex Rated Bucket Elevators give you three distinct cement mill application advantages: (1) takes little space — saves valuable floor area; (2) simple, vertical design cuts construction costs; (3) Rex Rated Balanced Design, practically eliminates down-time and production lags of ordinary elevators.

#### **DEPENDABILITY**

1. Shafer Double Roll Radial Thrust Roller Bearing Pillow Block supports head shaft. Unique bearing design provides a high degree of internal self-alignment . . . assures dependable service.
2. Heavy-duty Chabelco® steel non-roller type chain, selected on low live bearing pressures and high fatigue strength, assures maximum life.
3. Generous clearances between casing and bucket edges eliminate rubbing . . . assure longer life.
4. Internal gravity take-up assures constant, proper alignment of foot shaft providing longer life for chains and sprockets and bearings. Has heat-treated white iron and hardened tool steel sleeve bearings.

#### **RUGGEDNESS**

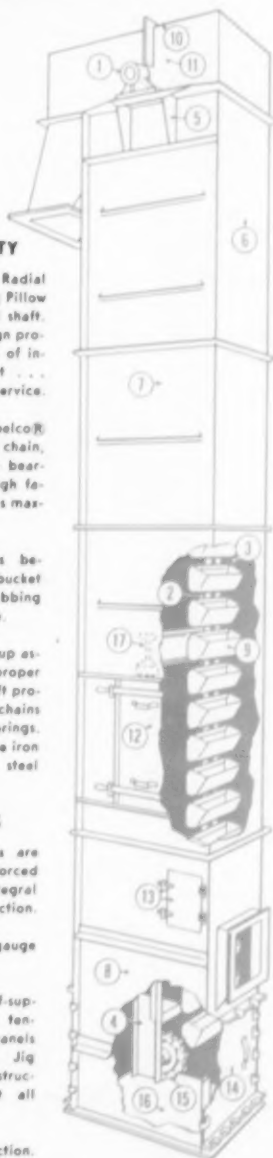
5. Head shaft bearings are supported by reinforced bracket supports, integral with the lower head section.
6. Head section of ten-gauge steel.
7. "Sky-scraper" self-supporting casing, with ten-gauge steel side panels crimped for stiffness. Jig welded dust-tight construction. Dust seals at all flanges.
8. 1/4-inch steel boot section.

#### **BIG CAPACITY**

9. Deep, wide buckets with hooded back and high front, closely spaced, assure maximum capacity, and complete discharge.

#### **CONVENIENCE**

10. Twelve-gauge steel split head section assures easy access to head shaft machinery.
11. Hardened cast steel segmental rim traction wheel with cast iron body keyed to head shaft.
12. Large access doors for easy maintenance and inspection.
13. Hinged type inspection door.
14. Front and rear access panels secured with special quick-acting spring clips.
15. Hardened cast steel segmental rim foot sprocket with solid cast iron body keyed to foot shaft. Rim sections easily replaced when worn.
16. Steel bottom plate assures easy cleanout.
17. Take-up removal beam.

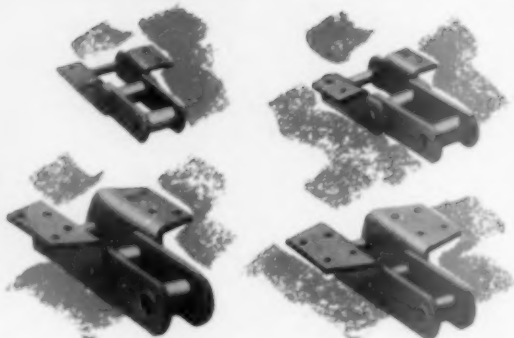


**TURN THIS PAGE FOR MORE INFORMATION**

## **CHAIN BELT COMPANY**

**LEADERSHIP . . . through creative engineering**

And for any elevator...  
these Rex balanced  
components add greater  
capacity, extra life



#### Ultimate in chain design for cement and elevator service

New and improved chains were developed to meet the larger capacities of the Rex Rated Elevators. The result — chains designed for greater strength and durability that answer the requirements of every condition.

**BALANCED DESIGN** ... Chain parts are balanced for utmost strength, lightest weight. There is less dead weight, less unneeded bulk. These chains take less horsepower to move than other chains for this service.

**MAXIMUM WEAR-LIFE** ... High quality steels, proper heat treatment, controlled press fits, large bearing areas, hardened surfaces plus fine workmanship assure maximum wear-life.

**ACCURATE PITCH** ... Close tolerances and controlled fits maintain accurate pitch for long, top-performance. Wide links and generous attachment length provide extra support for modern, large-capacity buckets.



#### Large-capacity buckets

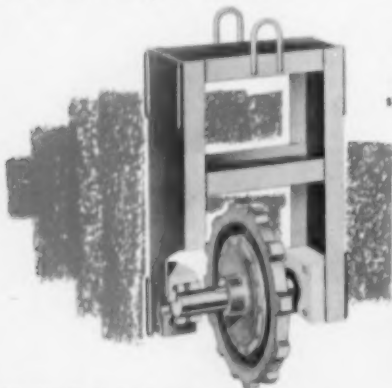
The development of new chains permitted the use of buckets of new design. These buckets take bigger loads and discharge fast. Even fluffy and aerated materials load and dump quickly. Chains and buckets are matched for greatest strength, capacity and durability.

#### Style AC buckets

Special hooded back maintains a high discharge efficiency even when buckets are continuously spaced. And the high front increases the "water level" capacity to allow greater capacity for free-flowing dry materials. Special air vents in the bottom act as a relief valve to prevent trapping during loading and unloading of fluffy, aerated materials. Extra thick bucket walls provide greater strength, longer wear.

#### Style AA buckets

Exceptionally tough and wear-resistant for handling heavy, abrasive materials. Cast of high-grade Rex Quality Malleable Iron. Front lip is extra thick for longest life.



#### Segmental rim sprockets and traction wheels

These tough and long-lasting sprockets and traction wheels have a special hardened, demountable cast steel rim. When replacement becomes necessary, you need only replace the rim section. Sprocket rims are machined both sides — are easily reversed to give double life. Besides giving extra long service, these sprockets and traction wheels will reduce down-time — save you hours, even days, of time.

#### Internal gravity take-up

This internal gravity take-up assures proper alignment of the foot shaft by automatically compensating for chain and sprocket wear and temperature variations. Chains, bearings and sprockets work better and last longer. Internal mounting makes boot section dust-tight. Special long-life bearings stand the roughest service without attention.



#### Shafer Self-Aligning Roller Bearings

Unique internal self-aligning feature of this bearing works smoothly when other bearings fail.

Mounted on the elevator head shaft, these Shafer® Double-Row Radial Thrust Bearing Pillow Blocks have a high degree of internal self-alignment. Heavy-duty construction plus self-aligning feature and special "Z" lubricant seal insures longest service. Micro-Lock adjustment makes installation and adjustment easy.

CHAIN Belt Company  
Dept. RP-1  
Milwaukee 1, Wisconsin

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- ☐ Send catalog on new Rex Bucket Elevator Components.
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**CHAIN BELT COMPANY**  
MILWAUKEE 1, WISCONSIN



Second level of quarry serving Apex, Nev., plant. Two 1½-cu. yd. shovels load trucks for the haul to the primary crusher



Truck dumping to apron feeder ahead of 42- x 48-in. eccentric-in-head jaw crusher. To the right is 5- x 8-ft. two-deck screen

## Boost Quarry Production To Meet Increasing Demands for Lime

### THREE QUARRIES

... in Nevada, operated by U. S. Lime Products Corporation, have been modernized to supply more stone for lime kilns at two locations

By WALTER B. LENHART

**S**URROUNDING LAS VEGAS, Nev., in a rough semi-circle are three interesting plants operated by the U. S. Lime Products Corp., a dolomite quarry at Sloan, a high calcium limestone quarry at Arrolime, and rotary kilns at Henderson and at Sloan. Sloan is south of Vegas about 19 miles, Arrolime is 22 miles north, and Henderson about 15 miles southeast. All plants are served by the Union Pacific Railroad. The main operating office for the company is at Henderson.

The company also has a lime burning operation at Sonora, Calif., and recently the company took over the operations of the Grand Canyon Lime Co., near Peach Springs, Ariz., where modernization plans are on the agenda. The Apex plant at Arrolime went into operation in 1946 and was described in *ROCK PRODUCTS*, May, 1947, page 82. A new 2000-bbl. portland cement plant is also a probability at the Apex operation.

### Apex Plant Improvements

During March, 1953, the Apex operation underwent a major revamping. The primary crushing equipment in use up to that time was moved to Sloan and replaced with new and

larger equipment. The new installation includes one of the world's largest, eccentric-in-the-head, jaw crushers supplied by the Pioneer Engineering Works. The crusher has been in operation a little over two years and during that time has handled about 800,000 tons per year. Because of the added motion in this type of crusher, plug-ups have been reduced practically to nil. The added motion also is said to give higher capacity. It is a 42- x 48-in. unit fed by a 14-ft. 6-in. Pioneer apron feeder. Electric power from

Hoover (Boulder) dam was brought into the Apex plant in 1953.

The crusher is set to deliver a 6-in. product which goes to a 48-in. belt conveyor serving a 5- x 7-ft. Tyrock two-deck scalper screen, operated dry. The top deck has 2½-in. openings and the lower deck, ¼-in. The plus material from both decks goes to a 36-in. belt conveyor for delivery to a 5000-ton (live) surge pile. Fines from the lower deck are moved by belt conveyor to a small ground storage pile, or it can go to a small truck loading silo. The ground stored material can be reclaimed to the same truck loading silo via a small bucket elevator augmented by the occasional use of a tractor and dozer.

Material in the surge pile is reclaimed by a Jeffrey vibrating feeder that delivers to a 5- x 12-ft. Tyrock two-deck screen, operated dry. From the top deck, the 6-in. stone is loaded to cars; also the 3- to 6-in. rock from the top of the lower deck. Minus 3-in. stone passes to a second two-deck screen that produces 1½-in. to 3-in. stone, ½-in. to 1½-in., and minus ½-in. The 1½-in. to 3-in. stone is sent by belt conveyor to a 50-ton steel bin from which cars are loaded. The 3-



Clawson Prince, superintendent, left, and James Curties, day foreman at Apex, Nev.



**A 30-in. belt conveyor** to surge pile under which is an apron feeder supplying 24-in. belt conveyor to screening tower at Sloan, Nev. plant



**To the left is screening tower** fed by 24-in. belt conveyor under surge pile, to the right

to 6-in. stone from the first Tyrock can be sent to a 48-in. Telsmith gyratory crusher with throughs returned by belt conveyor to the 36-in. conveyor from the surge pile. Minus 1/2-in. material from the second Tyrock screen is ground-stored over a reclaiming tunnel belt conveyor and the material re-screened in a separate plant across the railroad track which serves the main plant. At the re-screening plant any tramp, plus 1/2-in. stone is removed and discarded. It is small in amount.

The quarry is located a little above and behind the mountain, on the side of which is built the processing plant. A new lower level has been opened up. Quarry operations are now on three levels with a total height of 135 ft. On the older and upper level some dolomitic rock is stripped off but the amount is not large. Loading in the quarry is done with two No. 6 Northwest shovels, each with 1 1/2-cu. yd. buckets. The haul to the primary crusher is over relatively easy grades, using 15-ton Euclid rear-dump haulage units.

Primary drilling is with a Franks rotary drill using a 5 1/2-in. dia. Hughes

bit. It drills at the rate of 40 ft. per hr., and one bit will give around 4000 ft. of drill hole. An Ingersoll-Rand wagon drill is available for work on the strippings. A 315 c.f.m. Ingersoll-Rand compressor driven by a UD-18 International diesel is also used at the Apex operation.

#### Changes At Sloan Plant

The 30- x 42-in. Pioneer eccentric-in-the-head jaw crusher, formerly at Apex, is now in use at Sloan. It has been installed well up the mountain side but below the quarry openings. It is driven through "V" belts by a D-13,000 Caterpillar diesel. Belt conveyors and feeders related to the newer installation are electric-driven with power from a UD-18 diesel-electric set. A 30-in. apron feeder serves the primary crusher.

The Sloan operation features a surge pile ahead of the screening tower where a plus 1 1/2-in.; 1 1/2- to 3/4-in.; 3/4- to 1/2-in. and minus 1/2-in. sizes are produced. Most of the 1 1/2- to 3/4-in. stone is shipped by rail to the Henderson plant where it is calcined in rotary kilns. A flat running 30-in. belt conveyor delivers to the surge pile. In

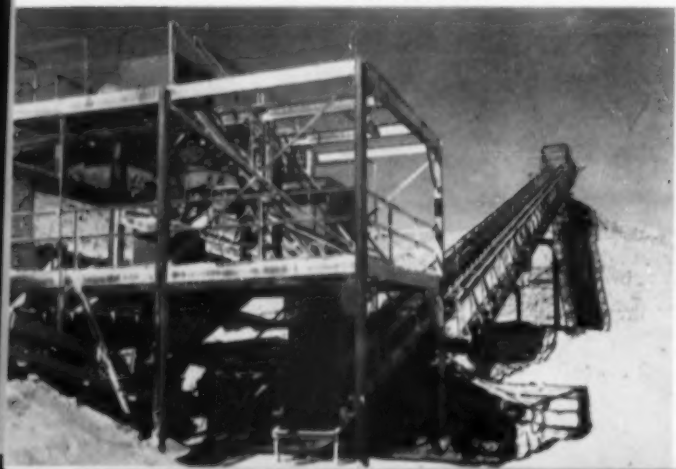
the reclaiming tunnel under the pile is an 18-in. apron feeder delivering to a 24-in. belt conveyor that serves the screening tower. The plant has a nominal capacity of 100 t.p.h. but has handled up to 150 t.p.h.

Sloan is an older secondary crushing plant using a 9- x 36-in. Alloys Steel & Metals Co. roller bearing crusher. Trucks deliver to the secondary plant. Two sizes of stone are prepared at Sloan for the two rotary kilns; one size for each kiln and they are recombined later. Loading in the pit is done with two 3/4-cu. yd. Northwest shovels with Euclid and International trucks delivering to the primary crusher hopper.

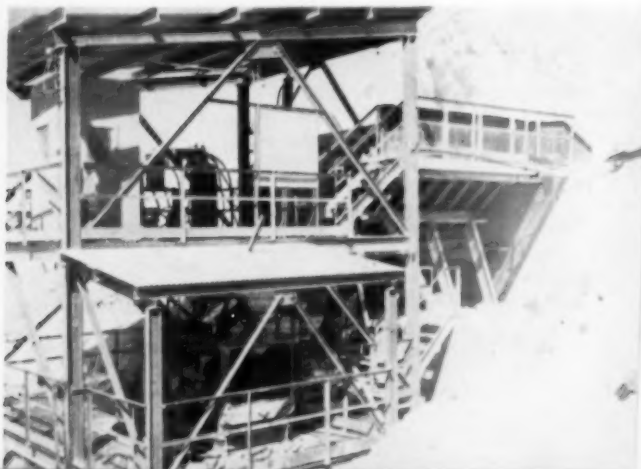
The main office of the U. S. Lime Products Corp. is in Los Angeles, Calif. Kennedy Ellsworth is executive vice-president. L. N. Grindell is manager of the Nevada operations. Clawson Prince is superintendent at Apex, and James Curles, foreman. William Ellis is superintendent at Sloan.

CARROLL SAND & GRAVEL CO., INC., Lake Providence, La., has been granted a corporation charter, with an authorized capitalization of \$100,000.

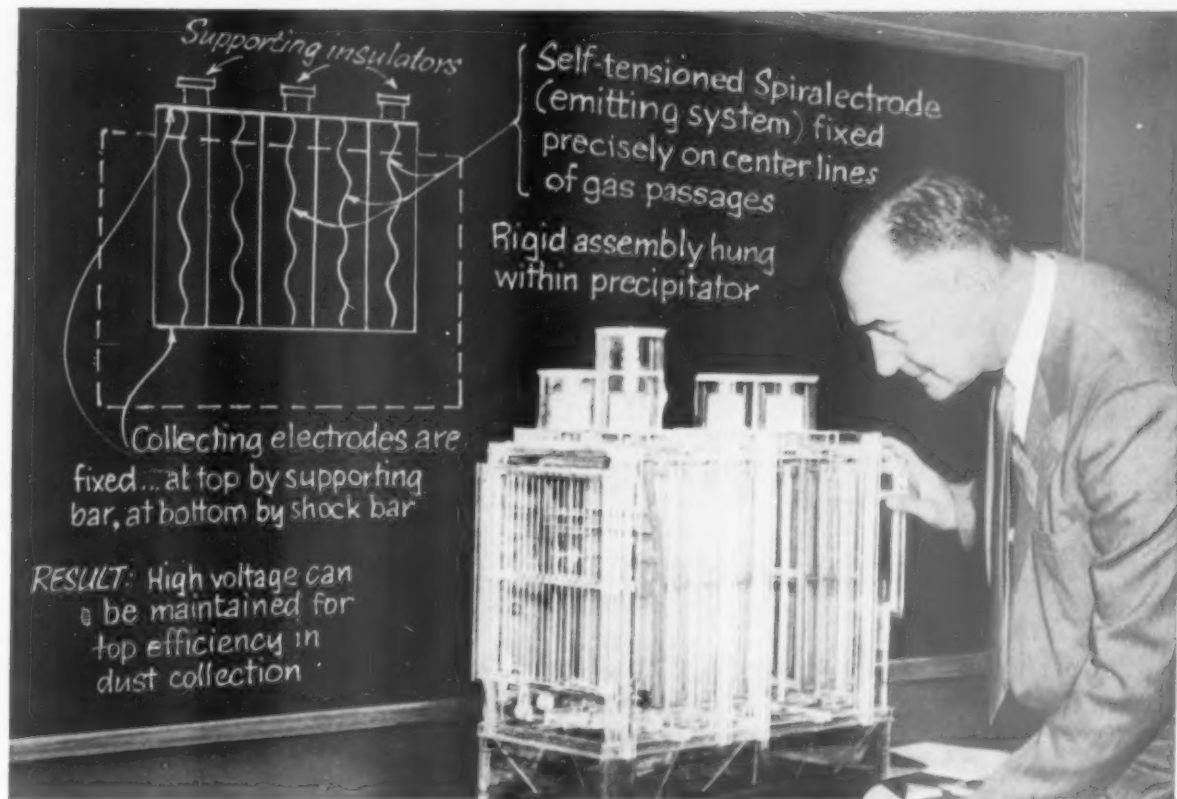
**Close-up of 36-in. belt conveyor** to surge pile with 5- x 7-ft. two-deck screen to the left, Apex, Nev. plant. Plus material from both decks goes to surge pile, and minus 1/4-in. is by-passed and ground-stored



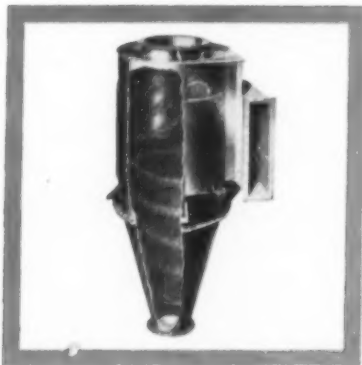
**A large diesel engine** drives the 30- x 42-in. primary jaw crusher at the Sloan, Nev. plant. The crusher is fed by a 30-in. apron feeder, to the right, above



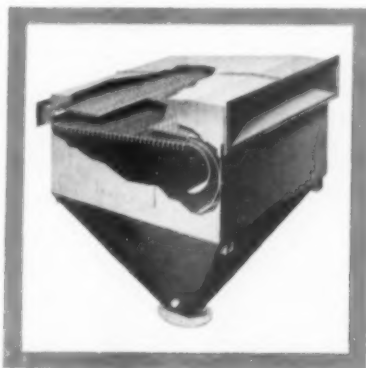
## How fixed electrodes assure top efficiency in a Buell "SF" Precipitator



PHOTOGRAPH OF BUELL PLASTIC MODEL BY INDUSTRY & POWER



Buell Cyclones also assure top efficiency with large diameter design to eliminate clogging... and by harnessing double-eddy and putting it to work.



Buell's Low Resistance Fly Ash Collector combines top efficiency to meet present strictness, with low draft loss for natural or mechanical installations.



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Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

ROCK PRODUCTS, June, 1956

103



Fig. 3: Gas turbine powered truck winding its way up to Stagecoach Summit on U. S. Highway 99 in southern Oregon

## GAS TURBINES

### In the Rock Products Industry

By L. W. PASSMORE

**I**NDUSTRIAL GAS TURBINES have made considerable progress in recent years for use in earth moving equipment, and as a lightweight portable prime mover for driving compressors and pumps. Advantages claimed by the makers of gas turbines versus use of oil and gas engines of more conventional designs are as follows: good torque characteristics, no cooling water requirements, flexibility of control, use of various low grade types of fuel (octane content is unimportant), and last but not least smaller size and weight per unit of power produced.

The simple, open-cycle gas turbine, Fig. 1, has a minimum of parts, and very little auxiliary equipment. It consists of an air compressor, drawing in fresh air, which is compressed and delivered into one or several combustion chambers. Here fuel is added, ignited and burned. The hot gases of combus-

tion expand in a gas turbine rotor and give up their energy. The use of materials for long life under high working temperatures enables the use of modern gas turbines for long operational

\*Acknowledgement is due to the Boeing Airplane Co., Seattle, Wash., for providing data and photographs for this brief survey.  
Henry C. Hill.—Paper presented Dec. 12, 1962, at a Symposium on Military Earth Moving Equipment at Fort Hueneme, Calif., Laboratory; also a paper presented May 17, 1964, at a meeting of Society of Automotive Engineers, Peoria, Ill., U.S.A.

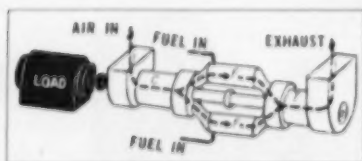


Fig. 1: Simple open-cycle gas turbine has a minimum of parts. It has six parallel combustors

periods as an economical reliable prime mover.

A gas turbine powered Boeing\* set was built as an experimental installation, and the self contained "power package" was run at constant speed for 500 hr., pumping 500 g.p.m. of water against a head of 240 p.s.i. Since then a number of pumping sets have come into operation in the United States and in Great Britain.

Fig. 2 illustrates a 60 kv.a. Boeing turbo-generator set driving a 400 cycle generator. This generator uses only 40 percent of the maximum possible power output and heavy short time overloads can be handled. A Boeing portable air compressor uses the same engine directly connected to a two-stage centrifugal air compressor delivering 1200 c.b.c./ft. of air per min. at 55 p.s.i.a. A number of these units have been in operation a long time, starting large aircraft jet engines.

In a Kenworth heavy motor truck tractor, the diesel engine was replaced by a gas turbine, thus lightening the vehicle by 3500 lb. It has been road tested for over four years with success. Automotive black diesel oil (about 2¢ a gal. cheaper than premium oil) was used on these runs.

Fig. 3 shows a Boeing gas turbine powered truck winding its way up to Stagecoach Summit on U. S. Highway 99 in Southern Oregon. It was on a Canadian border to Mexican border run when this photograph was taken in 1952.

PETE HALLING of Huron, Kan., has acquired the agricultural limestone business of Charles Blair, Denton, Kan. The firm operates four agstone spreaders and hauls agstone from the Kerford Quarry in Atchison and the Roy Baker Quarry near Severance, Kan.

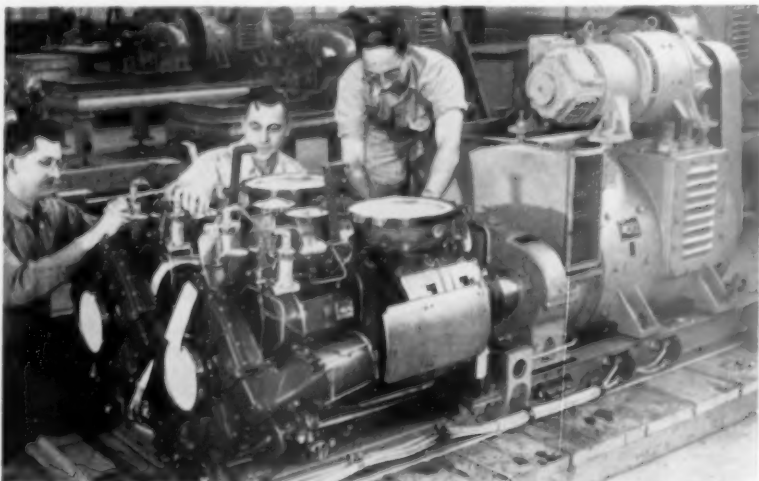


Fig. 2: A 60 kv.a. turbo-generator set driving a 400 cycle generator

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**Goes most anywhere . . . tows own air power  
Gardner-Denver self-propelled Air Trac**



Puts holes where you want them



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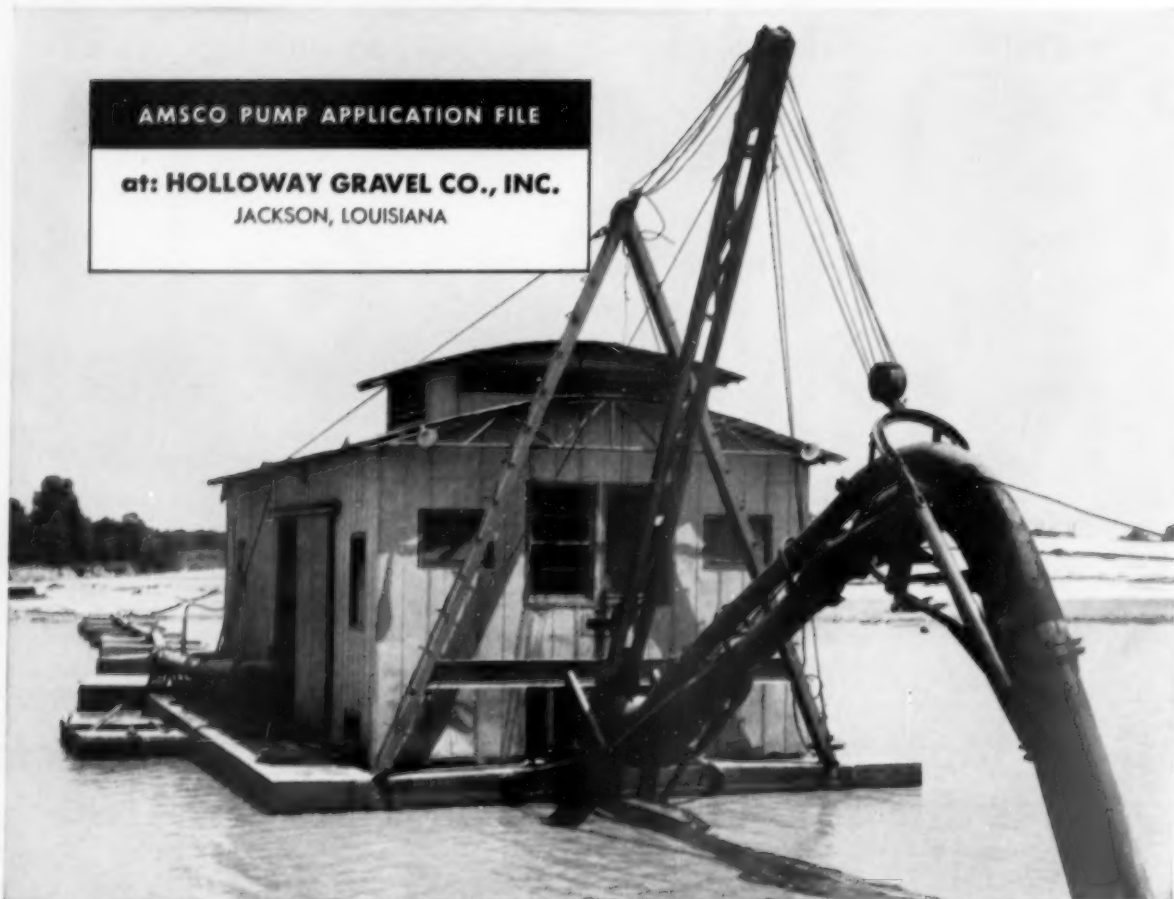
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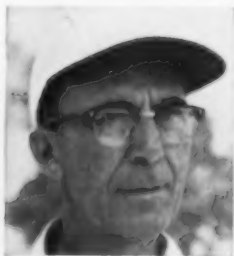
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

AMSCO PUMP APPLICATION FILE

at: HOLLOWAY GRAVEL CO., INC.  
JACKSON, LOUISIANA



**"AMSCO® is the only pump we can use in our  
speeded-up production system"**



To increase production at least 50% by jet-induced suction, equipment is stepped up from a normal 505 rpm to 720 rpm at Holloway Gravel Co., Inc. According to J. M. Hallman, superintendent at this company, "The Amsco is the only pump we can use under this speeded-up system and the only one that we would ever try to use. It is a very, very rugged pump... it has to be for our work."

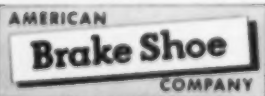
Holloway has loaded up to 15 cars—10 cars of gravel and 5 of sand—each hour for an eight-hour period using this speeded-up production method.

Holloway uses four 10" Amsco Counter-Flow pumps. Deposit averages 40% sand, 30% gravel, balance overburden. Total lift is 60 to 65 feet—pipelines up to 1500 feet in length have been used.

According to Mr. Hallman, "In our opinion, the Amsco gives maximum performance. Considering the extreme use we make of it, it exceeds expectations in the matter of maintenance and down time due to repair."

**QUICK FACTS ABOUT AMSCO PUMPS**

Whether your dredging operation is large or small, you can get an Amsco Dredge Pump to handle the job. Standard sizes range from 6" to 20" discharge openings. Larger sizes are also available. An Amsco Pump Engineer will be glad to discuss your requirements, or write for Bulletin 1052P, giving full information and specifications on the Amsco line.



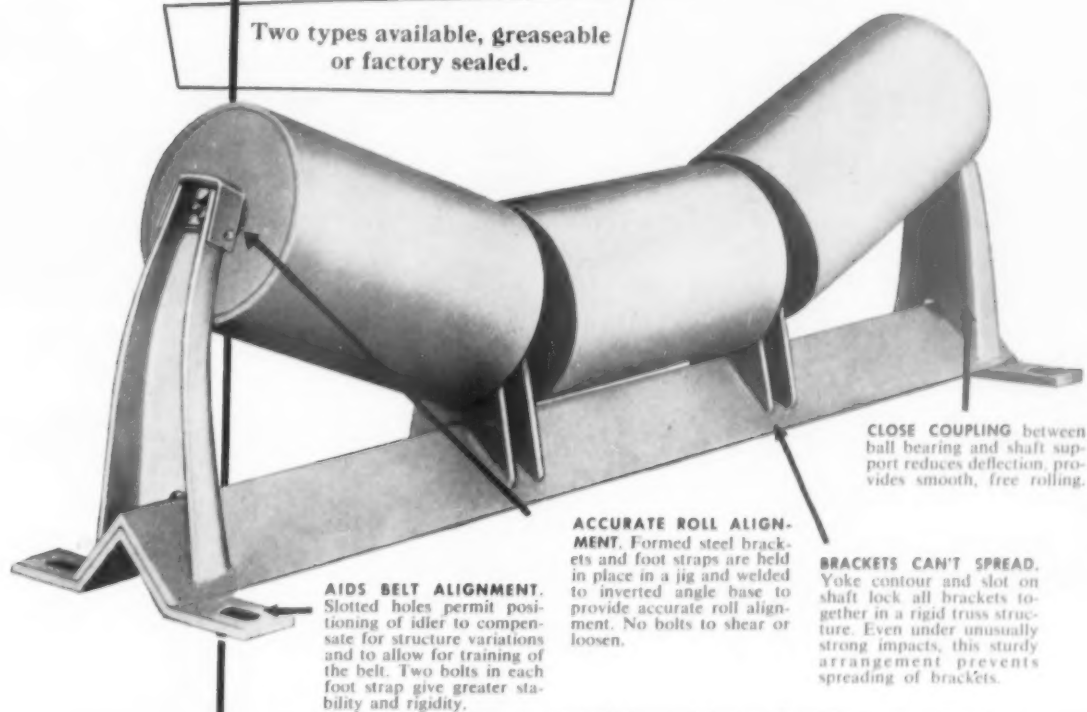
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American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

# NEW! LINK-BELT

## Series 50 idler



**GREASEABLE TYPE** has triple-labyrinth metal seal giving mechanical protection to moving parts while keeping grease in and dirt out.



**FACTORY-SEALED TYPE** consists of flexible synthetic rubber lip seal bonded to metal backing. No further lubrication is required.

- Initial and long-lasting economies
- Low power requirements
- Smooth, free rolling

**H**ERE'S a new idler designed for belt conveyors carrying medium loads or for intermittent operations. It's the new Link-Belt Series 50 which takes its place in industry's most comprehensive belt conveyor idler line.

Backed by Link-Belt's vast engineering and manufacturing knowledge and experience in designing complete belt conveyor systems, the Series 50 is a self-contained, well-balanced unit with bearings fully enclosed and protected. The roll consists of a smooth, uniformly thick outer shell plus a heavy-wall steel center tube brazed to dished steel heads, forming a strong, moisture-proof, integral unit. Ends of the outer shell are counter-bored, and the center tube is journaled concentrically to assure roll alignment.

For data on the Series 50, write for Folder 2516. Your Link-Belt office or authorized stock-carrying distributor will also give you all the facts along with Book 2416 on the complete Link-Belt idler line.



# LINK-BELT



**BELT CONVEYOR IDLERS**

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.



Overall view of plant showing scalper and primary section, to the right, and final screening and washing section, to the left

## PUSH-BUTTON Controlled Gravel Plant

### EXCAVATION

... over a wide area deposit is handled with an interesting drag scraper installation at the Pre-Mix Concrete, Inc. plant at Pasco, Wash. The plant supplies atomic projects

By WALTER B. LENHART

A GROUP OF THREE AFFILIATED COMPANIES opened a new sand and gravel plant early in 1955 to serve three southeastern Washington communities that are the hub of important atomic operations in the area. A feature of the new plant is a centrally located push-button controlled operating station.

The three affiliated companies are the Union Sand and Gravel Co., the Central Pre-Mix Concrete Co. of Spokane, Wash., and Pre-Mix Concrete, Inc. of Kennewick. The tri-city district served by the group includes the communities of Pasco, Kennewick and Richland, Wash. They are on the banks of the Columbia River, and only a few miles apart. The company group also took over a ready-mixed concrete operation at Othello, Wash., about the time the new plant was opened.

Important gravel deposits adjacent to the plant are controlled by Pre-Mix Concrete, Inc. Stripping is practically nil, with good gravel above and below ground water level. Most of the gravel now is coming from above water level,

but later more material will be taken from below. Digging in the pit is with a company-assembled, 2½-cu. yd. cres-

cent drag scraper that is powered with a 3-drum hoist. Two steel towers connected by a 1-in. steel cable act as the



Looking down into pit from the top of plant. A drag scraper bucket excavates material and dumps it to a hopper feeding main belt conveyor to the plant

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**TRU-LAY VHS**

**15% STRONGER**



## New VHS Dragline Gives 33% More Wear

Mr. W. D. Tierney, of Tierney Bros., Contractors of Lockport, Illinois, says: "The draglines on our 3500 Manitowoc lead a rough life. Therefore, when our distributor told us about the possibility of increased service with new TRU-LAY VHS draglines we decided to give it a chance.

This new dragline lived up to all the claims made for it. It lasted over four months under a variety of operating conditions—working in sand, gravel, earth and slag. We estimate that we got at least one-third more service from this dragline than we had been able to obtain before. And we particularly like the pre-lubricated feature."

VHS draglines are setting records like these on construction projects

all over the country. They are made from a new grade of steel for wire rope—and are at least 15% stronger than Improved Plow Steel—the best grade available until now.

### **For Heavier Loads, Higher Safety Factor**

TRU-LAY VHS's extra strength enables you to handle heavier loads with the same diameter line. And it gives a higher factor of safety for the entire service life of the rope.

### **For Shovel Hoist Ropes and Scraper Cables Too**

TRU-LAY VHS was developed especially for the toughest applications in the construction field—draglines, shovel hoist ropes and scraper cables. In addition to greater strength, it is

also tougher—more wear resistant. And it has all the advantages of pre-formed construction. This means that it lasts longer in the roughest construction services.

### **Cuts Down Time—Saves Money**

Because it is tougher and more wear resistant, TRU-LAY VHS rope lasts longer, costs less to use and cuts "down time" of equipment for wire rope replacement.

TRU-LAY VHS ropes are easy to order. Just ask for TRU-LAY VHS Shovel Hoist Ropes, Scraper Ropes or draglines, in the size you want. You don't need any complicated specifications.

Your American Cable Distributor  
has TRU-LAY VHS in stock now.  
See him or write to the nearest  
American Chain & Cable  
Company Office.

**ACCO**



**American Cable Division**  
**AMERICAN CHAIN & CABLE**

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston,  
Los Angeles, New York, Odessa, Tex., Philadelphia,  
Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.





**Close-up of plant;** sand is ground stored by the stacker belt conveyor, and the coarse aggregates are stockpiled by trucks



**A gyratory crusher** may be seen to the right with the scalping screen, above

outboard "dead-man" for the drag. A travelling bridle on the cable is spotted by the third drum. The scraper operator conducts all operations without leaving his operating shed. The haul-in line is  $\frac{7}{8}$ -in. size, and the pull-back is  $\frac{3}{4}$ -in. The shift cable on the bridle at the drum end is  $\frac{5}{8}$ -in. wire.

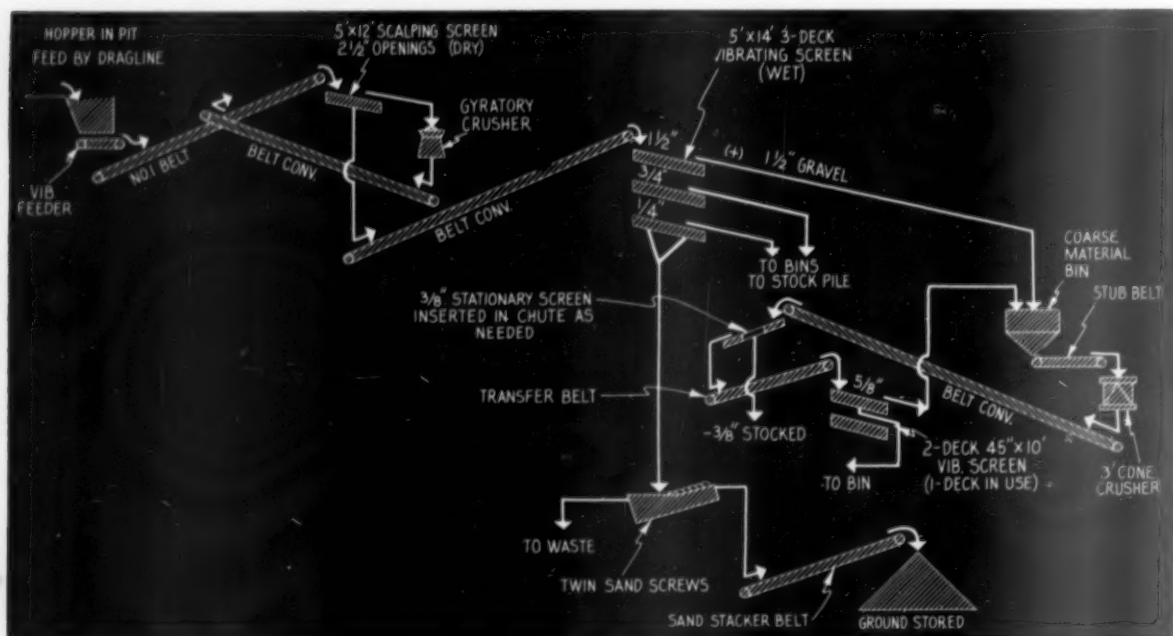
The new sand and gravel plant is on the east bank of the river, about eight miles upstream from Pasco and almost directly across the river from Richland. Plant capacity is 175 to 200 cu. yd. per hr. The new plant was designed and built cooperatively by the operating company and the General Machinery Co. of Spokane, Wash. Two reduction crushers are required to reduce plant feed to commercial sizes: a 13-B Telsmith gyratory and a 3-ft. Symons cone. The plant produces  $1\frac{1}{2}$ -in. and  $\frac{3}{4}$ -in. washed gravel, also

a minus  $\frac{1}{4}$ -in. washed concrete sand. A minus  $\frac{3}{8}$ -in. crushed product also is produced. Means are provided to scalp out some of the minus  $\frac{3}{8}$ -in. should the pit produce more than a normal amount of that size. A controlled amount of crushed gravel is blended back onto the gravel belt conveyor.

The flow diagram shows the essential features of plant processes. Gravel is drawn to a hopper by the crescent drag. A vibrating feeder under the bin serves No. 1 belt. The latter delivers to a 5- x 12-ft. Telsmith single-deck dry scalper. Screen surface of the scalper has  $2\frac{1}{2}$ -in. openings and uses  $\frac{7}{8}$ -in. diameter wire. The plus size from the scalper goes to the primary gyratory crusher, the crushed product being returned by belt conveyor to Belt No. 1. The minus  $2\frac{1}{2}$ -in. gravel

from the scalper is conveyed by belt to a 5- x 14-ft. Telsmith three-deck screen, operated wet. Separation is made on those screens at  $1\frac{1}{2}$ -in.,  $\frac{3}{4}$ -in. and  $\frac{1}{4}$ -in. The minus  $\frac{3}{4}$ -in. and the  $1\frac{1}{2}$ -in. gravel is sent to bins and made available for stockpiling. The plus  $1\frac{1}{2}$ -in. gravel falls to a bin and can be stockpiled by trucks if desired. It can be delivered to a 3-ft. Symons cone crusher via a short stub belt conveyor. The throughs from the cone are moved by belt conveyor and a transfer belt to a 45-in. x 10-ft. Cedarapids screen. It is a two-deck screen, but only one deck with  $\frac{3}{8}$ -in. wire cloth is used. A stationary screen can be inserted in the chute between the belt from the Symons cone and the transfer belt, to scalp out the excess  $\frac{3}{8}$ -in. If used, the small amount of  $\frac{3}{8}$ -in. produced falls

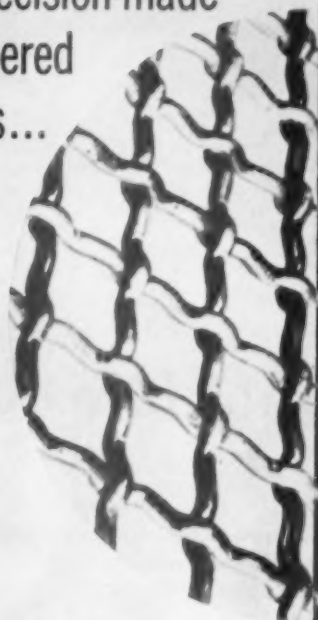
(Continued on page 174)



**Flowsheet** of screening, crushing, washing and stockpiling operations

# which best suits your needs?

extra-tough, precision-made  
Super-Tempered  
Space Screens...



...or rugged,  
economy-priced  
Wissco-Loy®  
Space Screens



Different sizing jobs require screens with different characteristics. That's why your CF&I representative carries both Super-Tempered and Wissco-Loy Space Screens—so he can offer you the one that will give you the most for your equipment dollar. For he knows that:

**Super-Tempered Space Screens** are made from oil tempered wire that is crimped to precision standards and woven extra tightly to maintain accurate, uniform spacing *resulting in the lowest cost-per-ton screening under the severest operating conditions.*

**Wissco-Loy Space Screens** are made of a special alloy steel wire that's carefully crimped at every wire intersection to assure accurate, tough and durable screens which hold cost-per-ton screening to a minimum.

There's a very simple way to find out which of these attractively-priced space screens is best for your own job. Just contact your nearby CF&I representative; he'll be happy to give you the complete story on both extra-tough, precision-made Super-Tempered and rugged, economy-priced Wissco-Loy Space Screens.



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3559



New \$15,000,000 Bonnie, Fla., phosphate chemicals plant where uranium compounds are extracted as a by-product in the production of multiple superphosphate for use as a plant food

# URANIUM

## Recovered from Florida Phosphate

### A BY-PRODUCT

... in triple super-phosphate manufacture is recovered in the form of uranium compounds at the new \$15,000,000 Bonnie plant of International Minerals & Chemical Corporation

By HUBERT C. PERSONS

**I**N ADDITION TO BEING THE WORLD'S LARGEST PRODUCER OF PHOSPHATES, the International Minerals & Chemical Corp. established the first plant in Florida for the full scale recovery of uranium from phosphate rock. The uranium is produced at International's new \$15,000,000 Bonnie, Fla., chemical plant as a by-product of the manufacture of high analysis phosphates.

As explained by Louis Ware, president of International Minerals & Chemical Corp., the uranium extraction unit at the Bonnie plant is a comparatively small activity. The company built the uranium unit at its own expense. Under a contract with the Atomic Energy Commission the com-

pany expects to amortize the investment in about ten years. Mr. Ware says a reasonable profit is expected from the operation but that it will have no important effect on the corporation's total income.

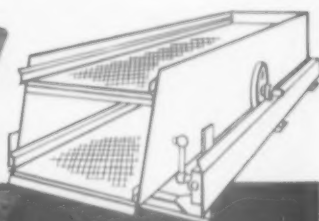
**Although the uranium content of phosphate rock in Florida runs from**

Aerial view of Noralyn phosphate processing plant near Bartow, Fla.



SECO SCREENS . . . ON-THE-JOB IN TOBACCOLAND

# Huge Granite Quarry Chooses 6 Seco Screens



## W. E. GRAHAM & SONS PLANT GEARED FOR EFFICIENT PRODUCTION

It takes an aerial view like the one above to show you the scope of W. E. Graham and Sons highly successful quarrying operation at Winston-Salem, North Carolina.

Here in tobaccoland, buyers of crushed stone demand clean, accurately sized material . . . and that's why this progressive operator's business keeps growing and growing.

Read what Mr. Lewis S. Graham wrote about SECO screens' part in this success story.

"Our main crushing and screening plant here at Winston-Salem is equipped with six SECO screens, some of which have been in use for quite a number of years. We have always had what we consider real good service from these screens from a standpoint of minimum down time, excellent capacity and the ability to deliver to our bins and stockpiles the properly sized stone to meet any required specification."

**SECO**  
TRUE CIRCULAR ACTION  
VIBRATING SCREENS

### Whether You Need One Screen or Twenty

SECO welcomes the opportunity to help you do a better screening job. Make 1956 your "look ahead" year. Plan now for years of more profitable screening, whether it's fine ag-lime or coarse rip-rap.

**SCREEN EQUIPMENT CO., INC.**

Buffalo 25, New York

SEND FOR NEW SECO CATALOG #204 TODAY



Hydraulic monitor breaks up phosphate matrix into a slurry which is pumped to the plant for washing, scrubbing, screening and treatment by flotation

only about 0.2 to 0.4 lb. per ton, the AEC is encouraging the production of by-product uranium compounds in the phosphate rock industry. Several such by-product plants have been set up in the past three years.

Detailed description of the uranium recovery process used at International's Bonnie plant is classified information under Government regulations. However, it may be said that in the manufacture of triple super-phosphates, phosphoric acid resulting from the leaching of phosphate concentrates, is piped to the uranium recovery

units. Here it passes through extraction units, precipitators and filters until a uranium compound is recovered. This is a wet, greenish, claylike material. It is packed in drums for shipment to the AEC. The remaining phosphoric acid, free of uranium, is then piped back to be neutralized and converted into triple super-phosphate or dicalcium phosphate. The latter compound which International calls "Dynafo", is used as an essential ingredient in the manufacture of animal feeds.

The Bonnie plant is operated by

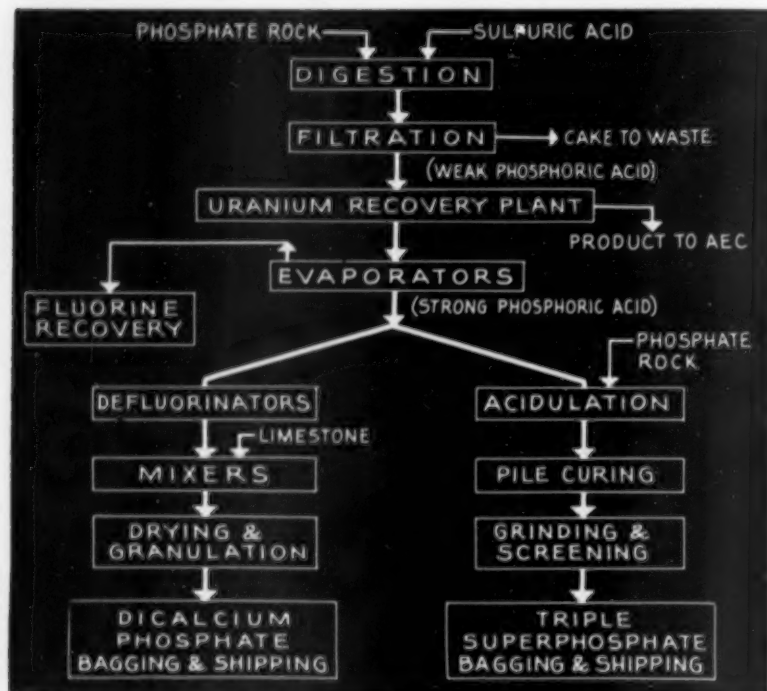
International's Phosphate Chemicals Division. The plant produces material for the manufacture of fertilizers including powdered triple super-phosphate, said to contain 46 to 48 percent plant food; granular multiple super-phosphate containing 50 percent plant food and the phosphate feed supplement mentioned above. About 225,000 tons of ground phosphate rock, 70,000 tons of rock phosphate concentrate and 180,000 tons of sulphuric acid are utilized in producing 180,000 tons of triple super-phosphate annually. The plant makes 500 tons of sulphuric acid per day.

A specially constructed building, 550- x 250-ft., is used for the storage of triple super-phosphate during a three or four-week curing period. This curing is said to increase the percentage of food elements available to the soil. Other plant facilities include four 110-ft. silos each capable of holding 3000 tons of "Dynafo". There is also a master control room from which the operation of the plant's filtration section is directed including a battery of 12 disc filters on which filter cake is formed. These resemble large, thin wheels mounted about a foot apart on a horizontally rotating axle. It is in this section that the filter cake is repulped, filtered and washed in five stages.

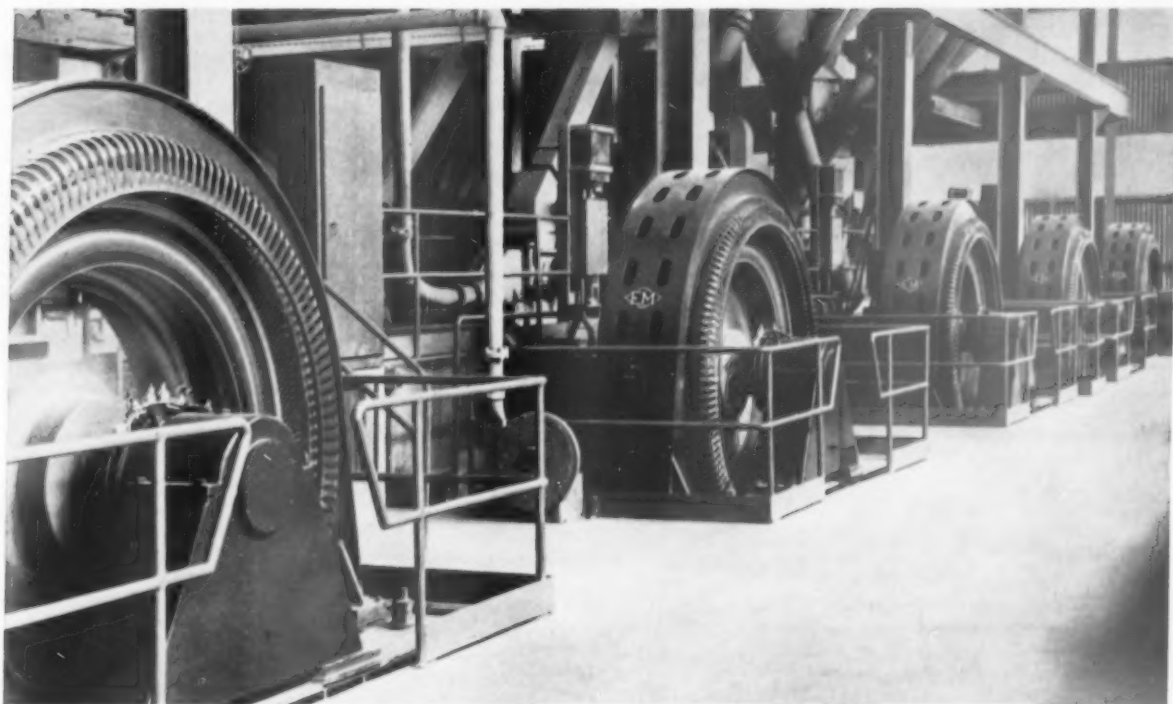
Two large scrubbers are used in series for the removal of fluorine, a process which requires 1200 g.p.m. of water. The vacuum pump room is equipped with eight large Worthington vacuum pumps and three Worthington air compressors.

International's Phosphate Minerals Division, with executive offices in a beautiful building at the edge of Bartow, Fla., operates three phosphate mines, three concentrating plants, and two dry mills, the latter for drying and grinding phosphate concentrates. Phosphate ore in the company's extensive tract near Bartow, occurs in the form of pebbles or in sand-like particles ranging down to the fineness of flour. This phosphate rock is found embedded in a matrix of earth 5 to 20 ft. thick and lying from 10 to 30 ft. below the surface.

Overburden is removed by large electric-powered draglines, the three used in the Florida operation being the largest ever used in phosphate mining. The dragline used at the Noralyn mine has a 26-cu. yd. bucket on a 235 ft. boom. This dragline is known as the "Super-Scooper." The dragline operated at the Peace Valley mine is called the "Bigger Digger." It has a 20.4 cu. yd. bucket on a 215-ft. boom. The third rig swings an 18-cu. yd. bucket on a 175-ft. boom. This one is named "Tillie the Toiler." All three



Bonnie plant flowsheet showing the point where uranium recovery takes place



Notable for advancements in safety and simplicity is the new grinding mill department of Dragon Cement Company, Northampton, Pa. An excellent example of compactness, it is designed to be safely operated by four men. Rated capacity will be 2,400,000 bbl. of cement annually.

## How Dragon Cement Company drives mills efficiently and safely in new 4-man grinding mill department



### E-M "INCHER" CONTROL

This E-M-developed control provides quick, safe spotting of grinding mills. It turns mills literally inch-by-inch into desired position, all at the touch of a button. One E-M "Incher" Control can serve several motors, saving time and greatly increasing safety.

● Helping to achieve labor conservation, simplified maintenance, and safety in this new raw and finish grinding mill are five rugged E-M Synchronous Motors rated 1000 hp, 180 rpm, 2300 volts, "unity" power factor. Specifically, here's how these E-M Motors contribute to new standards of economical plant operation:

1. **HIGH EFFICIENCY** conversion of electric power to mechanical power, resulting in minimum electric power cost for operation of mills.
2. **POWER FACTOR CORRECTION** with "unity" power factor helps keep over-all plant power factor high, further reducing power costs.
3. **DIRECT CONNECTION** of Motors to mills, thru rigid couplings for simplicity and minimum installation space.
4. **HEAVY-DUTY MILL-TYPE CONSTRUCTION**, including extra-heavy motor frame, high thermal capacity cage windings, dust resistant coil finish, and cool running sleeve-type bearings.

When you combine such motor features and top performance with E-M Hi-Fuse (high voltage, high interrupting capacity) Controls, you get the ultimate in protection as well. Complete safety for personnel and equipment, plus *extra safeguards* against short circuits and abnormal operating conditions. Your nearest E-M sales engineer can give you facts and data. Write the factory for E-M Publication No. 175 on large synchronous motors.

**ELECTRIC MACHINERY  
MFG. COMPANY**  
MINNEAPOLIS 13, MINNESOTA



Specialists in making motors do **EXACTLY WHAT YOU WANT THEM TO**



Walking dragline with 21-cu. yd. bucket, known as the "Bigger Digger", in operation at the Peace Valley phosphate deposit in Polk County, Florida

are Bucyrus-Erie walking draglines. "Tillie" was walked 13 miles from the Noralyn mine to the Achen mine, a two-week trip.

The composition of the matrix is about 30 percent phosphate rock mixed with varying percentages of sand and clay. The ore at International's Noralyn and Peace Valley mines is the concentrate type consisting of small particles. The ore at the Achen mine is pebble rock, mostly larger than 1 mm.

The pebble-type matrix is generally the source of a lower grade product than the concentrate. Much of the Florida production of phosphates today is from the concentrate type from which up to 95 percent of the phosphate is recovered with the flotation process. Before the introduction of flotation only the pebble-type matrix could be processed economically because of the difficulty of separating phosphate grains from sand grains of similar size. A large tonnage of the

pebble-type matrix remains available for mining, however, even though the higher grade pebbles were fairly well mined out before flotation was introduced.

Draglines first remove the overburden and pile it on land which has already been worked over. Then the exposed matrix is scooped up, 25 tons or more at a time, and deposited at the edge of a well or sump. The matrix is then broken up by a 6-in. stream of water at 90 p.s.i. from a pair of hydraulic guns. The matrix is sluiced into a well where it is pumped into a 16-in. pipe and carried by hydraulic pressure to the washing plant where it is started through four stages of processing. These stages are washing, flotation, drying and grinding. These processing steps put the matrix through a large McLanahan log washer, a series of vibrating screens, hydro-separators, spiral classifiers and flotation cells. The process as carried on at the

big Noralyn mill, was described in detail in *ROCK PRODUCTS*, June, 1948. There have been some refinements in the manufacturing process since that time but basically the procedure is the same.

The phosphate matrix is thoroughly scrubbed and screened in the washing plant. During this process the phosphate materials are separated into two sizes, minus 1 mm. and plus 1 mm. The larger size material, free of sand and clay, is routed to loading bins for shipment. The minus 1 mm. material is pumped to the flotation plant feed tanks. In the next step, phosphate feed in sizes from 14 mesh to 35 mesh are reagentized and separated on Humphrey spiral separators. The material ranging in size from 35 to 200 mesh goes to the flotation cells.

The plant process as well as the mining operations require tremendous quantities of water. For example, at the Noralyn mine, the pit pump moves 7000 to 10,000 gal. of water and matrix per min., distances of from one half mile to more than four miles through the 16-in. pipe to the processing plant. This represents 800 to 1200 tons of phosphate ore per hour.

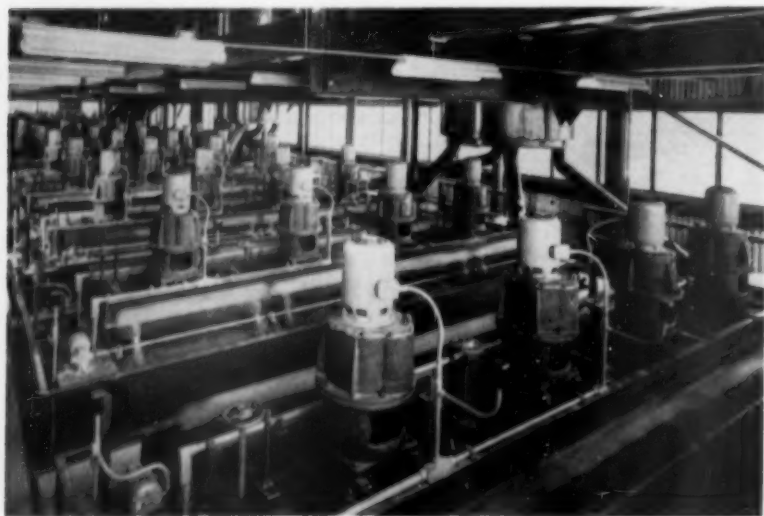
Fresh water is added and waste water taken out at several points in the processing sequence. The waste water is run to big thickeners as large as 383 ft. in diameter where clear water is separated from slime and reintroduced into the plant. The slime is routed to a large settling pond. Settling ponds cover approximately 1000 acres. Flow of slime is controlled by spillways. Eventually clear water from the settling ponds is returned for reuse in the plant. An 18-cu. yd. Euclid Twin Power Scraper is used to haul overburden to build dams in the settling ponds.

The Noralyn mine and mill are served by three deep wells having a total capacity of 18,000 g.p.m. About 80,000,000 g.p.d. of fresh water is used in the plant and mine. Settling and reuse of this water prevents pollution of streams near the mining property.

The Noralyn mill operates three, 8-hr. shifts, seven days a week. Even though the plant is large and the processes are complex, the flotation plant requires only about 11 men per shift, exclusive of maintenance men and helpers. This is possible because all equipment is controlled from an automatic panel board in a central control room. Seven men per shift are used in the mine.

A Service Center which looks after all maintenance operations and repairs for International's operations in the Bartow area, is located near the Noralyn mill. This Service Center includes

(Continued on page 176)



Battery of flotation cells where fines are treated for phosphate recovery

# NOW...BETTER HM SEPARATION

with OCC Vessel

because of its large  
productive pool area



Left, view of the interior of the OCC Heavy Media Vessel, illustrating its large pool area; view is from discharge end of vessel. Above, exterior view: float and sink discharges on left and feed chute on right.

U. S. and Foreign  
Patents Pending

## Simplicity of OCC Vessel Introduces Broad Operating Economies

Since the introduction of the Heavy Media process, the development of a separator whose simplicity would match that of the process has been an aim. This has been achieved through the design of the OCC Vessel illustrated above. The rake suspended in the center oscillates the width of the vessel. In so doing, it maintains in productive use practically the entire volume of the vessel, in contrast to other separators employing only a fraction of same. The result is improved metallurgy and increased economy.

The remarkable simplicity of the vessel is pointed up by the fact that the rake, the only moving part in the vessel, performs not only the function of removing the sink but also that of keeping the medium in suspension. Let us send you details of how the OCC vessel can increase your operating profits, and reduce maintenance costs in an HMS plant.



*Send for information on pilot plant  
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View of three of the plant units, showing pit conveyor and primary crushing plant, to the left; secondary crushing plant on the right, and washing plant in the background. Crushed gravel is being loaded in two trucks, to the right

## Supplying Sand and Gravel For Two Bituminous Mix Plants

### DIESEL POWER

... operates all equipment in the Barton Contracting Co. sand and gravel plant near Osseo, Minn.

By KENNETH A. GUTSCHICK

**A**N INTERESTING 150 to 175 t.p.h. sand and gravel plant serving the Twin Cities was placed in operation last spring by Barton Contracting Co., Minneapolis, Minn. The plant, which is located on a 110-acre site near Os-

seo (about 8 mi. northwest of the Minneapolis city limits), was built to supply specification aggregates for the company's two portable asphalt plants, as well as for commercial sale.

Originally the operation consisted of

portable diesel-powered primary and secondary crushing plants. However, during the late spring of 1955 the company added a permanent washing plant, after having won a bid for approximately 80,000 tons of washed concrete aggregates for the city of Minneapolis. In the present operation the pit-run material is split at the primary plant scalping screen, with minus 1½-in. material going to the washing plant and the coarser material going to the primary jaw crusher and then to the secondary plant for production of 100 percent crushed gravel.

During the initial pit development, the company is using a Caterpillar D8 tractor fitted with a U-bulldozer blade for pit recovery, the pit-run material being delivered direct to a field hopper. At present the maximum cut is about 400 ft. long, extending to a depth of 40 ft. at the edge of the property. The deposit is exceptionally clean and consists almost entirely of hard, tough crystalline igneous and metamorphic rocks; deleterious particles are practically absent. Overburden, averaging 5 ft. thick, is removed by a

(Continued on page 120)



Concrete sand is dewatered by a 24-in. by 25-ft. screw classifier and moved by belt conveyor to stockpile

**Allis-Chalmers**

model

**D**

**THE LOW-COST MOTOR GRADER  
THAT OFFERS**

**more of everything...**



**more** PRODUCTION-BOOSTING FEATURES

**Choice of Allis-Chalmers engines**

**GASOLINE** — 50 brake hp. Bare grader weight — 8,800 lb. Four forward speeds to 25.6 mph, one reverse to 3.3 mph.

**DIESEL** — 50 brake hp. Bare grader weight — 9,350 lb. Four forward speeds to 25.2 mph, one reverse to 3.2 mph.

**ROLL-AWAY moldboard** rolls the load instead of pushing it, moves more dirt, uses less power.

**Plus** one-piece tubular frame, tandem drive, real operator comfort, hydraulic blade lift.

**USEFUL OPTIONAL FEATURES**

**Power circle turn** for faster, easier, better control of blade . . . turns 135 degrees.

**Leaning front wheels** with heavy-duty axle, for better control in close quarter-work.

**Hydraulically shiftable moldboard** to speed work around obstructions. Shifts 16 in. each way.

**Special large tires** for added traction, long wear. Front (7.50-20 or 8.25-20) and rear (8.25-20).

**more** JOB-MULTIPLYING ATTACHMENTS

**Hydraulic scarifier**, mounted amidships for maximum effective ground pressure.

**Shoulder maintainer** for safe, one-pass operation. Also available: one-pass windrow eliminator.

**Rear-mounted 3/8-yd loader** for fast, low-cost handling of materials.

**plus** snowplows, completely enclosed standup cab, hydraulically operated mower.

**more** SATISFIED USERS

Since its introduction in 1949, thousands of satisfied owners have *proved* the usefulness and low-cost versatility of the Model D on all kinds of construction and maintenance.

**Call** your Allis-Chalmers Construction Machinery Dealer for a demonstration today!

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Roll-Away is an Allis-Chalmers trademark.



Overall view of plant and stockpiles. Left to right: Washing plant, secondary crushing plant, primary crushing unit, and tractor-



bulldozer feeding hopper. Tractor-bulldozer, to the left is stockpiling sand. Pit is to the right, out of view

12-cu. yd. Caterpillar Model 70 scraper.

## Two Portable Plants

Delivery from the hopper to the Universal 546PS-2036 primary crushing plant is effected by a reciprocating plate feeder and a 30-in. inclined belt conveyor, 45-ft. centers. The primary plant incorporates a 4- x 8-ft. Simplicity double-deck scalping screen and a 20- x 36-in. overhead eccentric Universal jaw crusher; power is supplied by a six-cylinder General Motors Corp. 671 series diesel engine mounted on the frame. The scalping screen (only one deck is used) makes a separation at 1½-in., with the oversize going to the jaw crusher and the throughs to the washing plant.

The minus 2-in. jaw product is carried to the Pioneer 1435 secondary crushing plant by a 30-in. delivery conveyor, 30-ft. centers. The secondary unit consists of a 30-in. feed conveyor (42-ft. centers), a 4- x 10-ft. 3½ deck screen, and a 4022 triple roll crusher, which is closed-circuited to the screen by a 24-ft. return conveyor (26-ft. centers). A truck-mounted Caterpillar D364 diesel engine drives the entire secondary plant. Using only two decks with separation at ¾-in. and No. 4 mesh, respectively, the screen produces ¾-in. gravel and minus 4-mesh sand, with the plus ¾-in. material being recrushed by the roll. The two finished products are conveyed to stockpiling trucks by means of individual paralleling conveyors;



Eugene Barton, president, left and L. M. McGray, secretary-treasurer

one is a 30-in. belt, 30-ft. centers, which is part of the plant, and the other is a separate 24-in. conveyor, 25-ft. centers, driven by a gasoline engine. The 100 percent crushed ¾-in. gravel produced in this manner is sold as a bituminous aggregate in the Twin Cities area, and competes favorably with crushed granite aggregates brought in from more distant sources of supply.

## Dual Washing Plant

Minus 1½-in. material from the primary scalping screen is carried to the washing plant by means of a two-stage 24-in. belt conveyor (20- and 115-ft. centers, respectively). The plant, a dual Pioneer 306W all-steel facility, consists of a pair of 42-in. x 20-ft. heavy duty combination revolving scrubber-screens, each of which is followed in the flow by a 24-in. x 25-

ft. Eagle Iron-Works sand screw classifier. The revolving units incorporate an outer 3-ft. rock jacket and 8-ft. sand jacket, and an inner 42-in. x 4-ft. scrubber and a 42-in. x 16-ft. screen (the latter consisting of a 9-ft. pea gravel screen and a 7-ft. rock screen). The finished gravel products are discharged to four two-compartment Pioneer steel bins, each having a capacity of 21 cu. yd. The two sand products are carried to the Eagle screws and then transported to the stockpiles via individual 18-in. belt conveyors, 60-ft. centers.

During the writer's visit, one trommel screen was producing four products, including 1½ to ¾-in. (binder) gravel, ¾ to ⅞-in. (pea) gravel, ⅞-in. to 4 mesh. (buckshot) gravel, and minus 4-mesh sand. The latter product (concrete sand), was dewatered on the Eagle screw before being stockpiled. The second trommel produced three products, including 1½- to 1¼-in. (binder) gravel, 1¼- to ¾-in. (concrete) gravel, and minus ¾-in. sand, the latter product representing block sand after dewatering by the second Eagle Iron Works screw classifier.

The washing plant is powered by electricity supplied by a combination Caterpillar D337 diesel engine and Kato-Light a.c. 187 kv.a. 220/440-volt generator. This unit also serves the outdoor lighting system and two pumps. Electric motor drives for the revolving scrubber-screens and screw classifiers are 25-hp. and 10 hp., respectively.

(Continued on page 180)

Two views of the washing plant which comprises two revolving scrubber-screens and two spiral sand classifiers. Gravel products

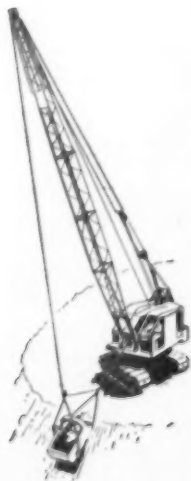
are stored in bins, and the sands are delivered to stockpiles by belt conveyor



It's time to compare...with **LINK-BELT SPEEDER**



**"First time a shovel has kept us rolling like this!"**



#### **Shovel-Crane owners:**

**New Link-Belt Speeder performance is so outstanding, it has completely revised existing production standards . . .**

With competition getting rougher, can you afford to think in terms of outdated production standards? If you aren't using a Link-Belt Speeder or haven't seen one in action recently—it's hard to realize just how much more production . . . more usable net horsepower these new shovels, cranes and hoers offer.

Speed-o-Matic power hydraulic controls—a Link-Belt Speeder exclusive—make every move fast, sure, easy. With them, you can boost output—often as much as 25% or more!

#### **From track treads to boom tip**

. . . every detail of a Link-Belt Speeder reflects advanced engineering, skilled craftsmanship, pre-

cision construction and quality materials.

And look at this list of standard and optional features — independent swing and travel . . . independent rapid boomhoist . . . torque converter . . . third drum . . . reversing clutches for both hoist drums . . . and power hydraulic-actuated swing brake, to mention only a few.

It's good business to compare now! See why more and more Link-Belt Speeder owners have completely revised their thinking on how fast a job will go. Your distributor will be pleased to arrange for you to see a new Link-Belt Speeder in action, give you the facts. Call him now! Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

1A, 159

### **LINK-BELT SPEEDER**

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# Lime Producers Look for Big Market In Soil Stabilization

• Record output for 1956 predicted at the National Lime Association annual convention in Boca Raton, Fla.

**I**NCREASING USE OF LIME, particularly in the field of soil stabilization, was the major topic of discussion at the 54th annual convention of the National Lime Association, held in Boca Raton, Fla., April 19-21. Continued record lime sales were forecast, with a 10,000,000 ton output being anticipated for 1956. Excellent progress in the association's lime stabilization program was reported, and Robert S. Boynton, general manager, predicted that the market for stabilizing lime by 1965 may amount to 500,000 tons annually.

In spite of the optimistic outlook, however, several speakers emphasized the need for continuing research to develop new markets and to extend old markets. Professor Walter C. Voss, M.I.T., proposed a comprehensive research program which would delve into the fundamental nature of limestone, quicklime, and hydrated lime; he predicted that the findings would lead to better processing and development of new lime uses. Other topics included percentage depletion, arbitration, safety, management of expanding enterprises, foreign lime developments,

and the use of lime in water and sewage treatment.

Meeting at the Boca Raton hotel for the first time, the association members and guests, numbering about 100, enjoyed the splendid weather and the excellent facilities of the hotel and Cabana Club located on the ocean. Extra-curricular activities comprised the annual golf tournament, a boat trip on the Florida Intracoastal waterway, deep sea fishing, an evening reception sponsored by St. Regis Paper Co., a cocktail party held at the nearby home of the Lester Crown's (Marblehead Lime Co.), a steak fry on the beach at the Cabana Club, and the annual banquet.

## Rickard New President

M. A. Rickard, vice-president, Southern Cement Co., Birmingham, Ala., was elected president of the association for 1956-1957, succeeding Amos B. Miner, National Gypsum Co., Buffalo, N. Y. Re-elected to the other offices were as follows: general manager, Robert S. Boynton; assistant secretary, Georgia M. Coffman; treasurer, Paul Sunderland, chairman of the



M. A. Rickard, Southern Cement Co., newly elected president of N.L.A.

board, Ash Grove Lime & Portland Cement Co., Kansas City, Mo.; chemical engineer, Kent Jander; and highway engineer, Conrad M. Kelley.

Chas. E. Rarey, Marble Cliff Quarries Co., and Amos B. Miner, were elected to the executive committee, replacing Michael Brisch and Ralph L. Dickey. Other members of the executive committee are Reed C. Bye, Warner Co.; Bolton L. Corson, G. & W. H. Corson, Inc.; K. L. Hammond, Keystone Lime Works, Inc.; C. C. Loomis, New England Lime Co.; and Wallace E. Wing, Marblehead Lime Co.

The following were elected to the board of directors:

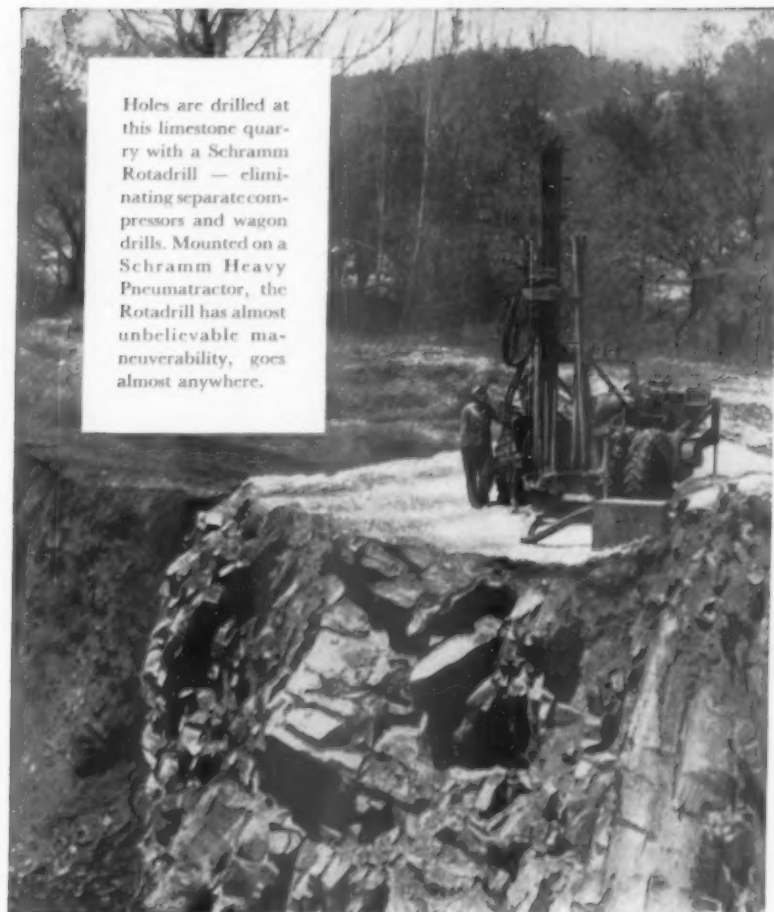
- Region I — C. C. Loomis
- II — B. L. Corson; Claude H. Barriek, S. W. Barriek & Sons, Inc.; and E. D. Williams, H. E. Millard Lime and Stone Co.
- III — Amos B. Miner; Reed C. Bye; and J. Glenn Hawthorne, Mercer Lime & Stone Co.
- IV — Chas. A. Hartman, Peery Lime Co., Inc.; and Ralph L. Dickey, Chemstone Corp.
- V — F. J. Collins, Basic, Inc.; and Franklin Witmer, Ohio Lime Co.
- VI — Chas. E. Rarey
- VII — L. N. Carmouche, Dow Chemical Co.
- VIII — E. H. Siebrasse, Menke Stone & Lime Co.; R. F. Mathews, Mississippi Lime Co.; and Wallace E. Wing.
- IX — Michael Brisch, Rockwell Lime Co.
- X & XI — M. A. Rickard and Geo. L. Scott, Jr., Alabaster Lime Co.
- XII — R. W. Hunt, Southwest Lime Co.; and Paul Sunderland.
- XIII — J. S. Offutt, U. S. Gypsum Co.; and G. E. Robinson, Austin White Lime Co.
- XIV — Undetermined
- XV — D. G. Ellis, West End Chemical Co.; and D. M. Kerr, Kaiser Aluminum & Chemical Corp.

(Continued on page 124)



Past-presidents of N.L.A., Wallace E. Wing, Marblehead Lime Co., Chicago, Ill.; Amos B. Miner, National Gypsum Co., Buffalo, N. Y.; and K. L. Hammond, Keystone Lime Works, Inc., Keystone, Ala.

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sure. Normal compressed air drilling pressures of 20-30 psi can be instantly increased for dewatering or breaking out blockages. Drilling controls are mounted in one complete bank, conveniently located for one-man operation. Standard Rotative Head has 75 RPM output and can be throttled down to complete stall while maintaining constant torque. Heavy welded structural steel mast, lowered for traveling between jobs, can be operated at various angles for sloping holes.

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B. J. Gee, director, Settle Limes, Ltd., Yorkshire, England, left; R. S. Boynton, general manager, N.L.A., center; and Dr. N. V. S. Knibbs, Longfield, Kent, England

### President's Report

In his opening remarks, Amos B. Miner thanked the association staff and the past-presidents for the excellent cooperation given to him during his 3-year term as president. He reported that 1955 was the busiest and most prosperous year for the lime industry, with shipments totaling 9,230,000 tons—an increase of 1,700,000 tons over 1954. He added that another record is promised for 1956.

Mr. Miner called for continuing research to extend old markets and develop new markets. The establishment last year of an association technical committee and the hiring of Conard M. Kelley as highway engineer to promote the use of lime in soil stabilization were considered steps in the right direction. The speaker lauded Mr. Kelley for the rapid progress he made

during his first few months on the job.

Mr. Miner also praised the association for increasing the number of research fellowships and for its work on percentage depletion. He remarked that the association accounts for 85 percent of the tonnage of open market lime produced in the U. S.

### General Manager's Report

In his annual report, Robert S. Boynton, general manager, stated that a brisk demand for lime is continuing, and the industry is headed for a record 10,000,000-ton year in 1956. He referred to lime as an excellent business barometer, based on its use in chemical, building and agricultural industries. The table below was cited to compare the growth of the lime industry with other industries during the last ten years (data based on shipments).

	Growth 1945—1955
Soda Ash	+ 12 percent
Calcium Carbide	+ 28 percent
Steel	+ 50 percent
LIME	+ 56 percent
Sulfuric Acid	+ 66 percent
Portland Cement	+ 71 percent
Caustic Soda	+ 105 percent
Chlorine	+ 184 percent
Ammonia	+ 433 percent

Mr. Boynton pointed out that the association has been active in public relations, supplying data for two recent trade journal articles. One article, "Lime's Mainstay; Chemical," appearing in *Chemical Week* (March 17, 1956), glamorized lime as the second greatest chemical. The *Wall St. Journal* is also expected shortly to publish an article on lime. Through this publicity, Mr. Boynton hopes chemical engineers will think first of lime in solving their problems.

The speaker termed the new book, "Exterior Masonry Construction" by Prof. Walter C. Voss, the finest treatise on building lime ever published by N.L.A. It has evoked many favorable comments, and copies are going fast. The association also reported record sales of other literature. Work on the publication, "Neutralization in Trade Waste Treatment," is three-fourths completed, he reported.

Research projects being carried on at several universities was also discussed. Professor Murray of M.I.T. has developed a new, improved lime-plasticity test, and his report on the quality of various limes has just been issued. Purdue has completed its research on the use of lime in flocculating oil wastes and in breaking oil emulsions, and is embarking on a new program involving the use of lime as a neutralizing agent in reducing air pollution. Tests involving the recently-developed cohesiometer at the University of Texas have yielded high tensile strength values for lime stabilized soils. A new patentable process involving the use of lime, expanded shale fines, and gravel has been developed which has possibilities in competition with portland cement concrete as a road wearing surface. Up until now, the speaker pointed out, lime primarily has been used with success for sub-base or base course construction. Two consumers are studying with interest the Rutgers University research on sludge and trade waste. Work on elasticity of mortars is still progressing at Franklin Institute; one initial finding points to better mortars with more lime used.

In commenting on the association's newest program — lime stabilization, Mr. Boynton lauded the progress made by Mr. Kelley. Indicative of his enthusiasm for this project, the speaker predicted that within 10 years, the market for stabilizing lime may reach as much as 500,000 tons per year.

Mr. Boynton concluded by emphasizing the great need for continuing



In this group are: Mr. and Mrs. Reed C. Bye, Warner Co.; Mr. and Mrs. Burton A. Ford, St. Regis Paper Co.; Mr. and Mrs. Amos B. Miner, National Gypsum Co.; Mr. and Mrs. John V. Andrews, Chemstone Corp.; and Mr. and Mrs. K. L. Hammond, Keystone Lime Works, Inc.



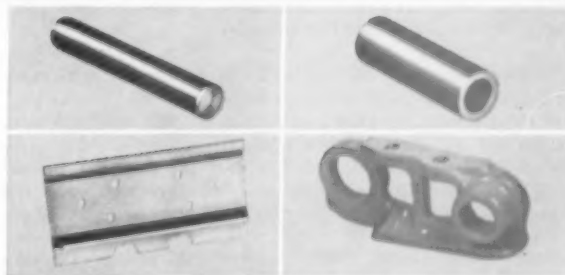
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**Clockwise, around the table:** Irving Warner, Warner Co.; Mrs. Wallace Wing; Robt. S. Boynton, N.L.A.; Mrs. Lester Crown, Marblehead Lime Co.; Mr. and Mrs. Meyer Schine, Boca Raton; Wallace Wing, Marblehead Lime Co.; Mrs. and Mr. M. A. Rikard, Southern Cement Co.; Mrs. R. S. Boynton; Lester Crown, Marblehead Lime Co.

market research, and the important role to be played by the trade association in directing research activity. He termed research the life blood of any industry. Many industries have declined due to aggressive competition, technological developments, coupled with complacency.

#### Highway Engineer's Report

Progress of the association lime stabilization promotional program was discussed by Conard M. Kelley, N.L.A. highway engineer. During his first seven months of employment with the association, Mr. Kelley made 63 visits to 27 state highway departments and 11 visits to various governmental agencies (Corps of Engineers, Toll Road Commissions, Bureau of Public Roads, etc.); he also attended seven national and regional highway conferences. These visits required over 60,000 miles of travel.

In his presentation, Mr. Kelley commented on the attitude of various highway departments towards lime stabilization and on the status of projects already underway. Louisiana has recently completed a 5 mi. lime stabilized base section, is ready to let a con-

tract for 50 additional miles (8-12 in. stabilized base, requiring 150-250 tons of hydrated lime per mile), and may have 90 miles under construction by the end of the year. A large remarkable job has just been completed in the Texas Panhandle; it will be watched carefully since three days after completion, the base was covered with 26 in. of snow. Kansas has completed its first job, and highway officials there are enthusiastic about lime stabilization. Nebraska and Virginia are planning test sections, and Florida, Connecticut, Nevada, Washington, and Wisconsin are undertaking laboratory tests. Alabama is planning a lime stabilization job in 1957. Mr. Kelley indicated that Ohio, Illinois, and Missouri are becoming interested, and he thought that within 1-5 years each may try lime stabilization. Pennsylvania, New Jersey, and Maryland have already had outstanding success with lime-fly ash stabilization, he reported.

In conclusion, Mr. Kelley stated that lime will have a favored position among various road building materials in the future expanded highway program. He pointed out that the rapid depletion of high quality materi-

als will lead to the use of marginal stone, gravel, or soil-in-place for base courses; in any case lime will be an effective economical stabilizer. Contractors prefer lime, he said, because it greatly improves the workability of clay soils and permits operations even in wet weather. Further, lime is generally lower in cost than competitive stabilizer materials.

#### Percentage Depletion, Arbitration

In discussing percentage depletion, J. Milton Cooper, N.L.A. tax consultant, Washington, D. C., warned the industry against complacency. He pointed to recent attempts made by so-called tax philosophers to alter drastically the entire federal income tax structure. These men consider grants like percentage depletion a "random erosion" of the tax base—which tend to make the income tax "a wasting asset of the nation." The Treasury Department is also subtly questioning the justification for percentage depletion overall, Mr. Cooper reported. Finally he said, there is a minority group in Congress that fails to see the justification for percentage depletion for extractive industries. Some even want complete repeal of all depletion allowances.

As an aftermath of the natural gas legislation this year (the "Case case"), S.3151 was introduced by Sen. Williams (R.-Del.) to reduce percentage depletion allowance for oil and gas from 27½ to 15 percent. More recently, he said, H.R. 10044 was introduced by Rep. Reuss (D.-Wis.) to reduce drastically percentage depletion for all the extractive industries — 3 percent would be the allowance for limestone.

However, Mr. Cooper thought that these attacks should not cause any undue alarm at this time. He predicted that there will not be any major tax legislation enacted before Congress adjourns. Yet, he stressed, the industry must remain vigilant and must maintain a readiness for concerted action to protect this equitable tax treatment.

Mr. Cooper also commented on recent treasury department and judicial decisions relating to percentage depletion rates and the "cut off" issue. He said the association has filed a brief with the Treasury Department calling for elimination of the end-use test in its regulations relating to the 1951 Act. This stand on end use is completely contrary to the intent of Congress and the language of the law, he said, and producers are not forced to accept the Treasury Department's view and can appeal in the courts.

Two recent court cases involving related industries were cited which illustrate the fact that taxpayers are not



**Clockwise, around table:** C. H. Ellison, Jr., Southern Cement Co.; Mrs. R. E. Pflaumer, American-Marietta Corp.; R. E. Pflaumer; Mrs. C. H. Ellison, Jr.; Mr. and Mrs. W. J. Cabaniss, Southern Cement Co.

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<input type="checkbox"/> SUPERFINE SELECTING	<input type="checkbox"/> GRANULATING	<input type="checkbox"/> CONVEYING



**John C. Best**, recently retired vice-president, National Gypsum Co., who spoke on arbitration

forced to abide by the Treasury Department views. These included *Hitchcock Corp. v. Townsend*, 132 F. Supp. 785 and *Cherokee Brick & Tile Co. v. U. S.*, 218 F. (2d) 424. In the *Hitchcock* case the court ruled that, for talc, all mining and manufacturing processes (including the bags and containers for talc) which are normally applied to obtain the first commercial marketable product are included in the depletion computation. The court also adopted the "first commercially marketable test" for percentage depletion computation in the *Cherokee* case, taking into account both mining and manufacturing processes.

Regarding the limestone industry, the speaker stated that the main problem involves the determination of a "representative market or field price"—especially at plants where part of the limestone is calcined, the remainder being sold as crushed stone. He thought that in some cases the Treas-

ury Department may consider the representative price as that obtained from the low-price uses. If this stand is taken, Mr. Cooper advocated appealing to the courts.

In commenting on H.R. 9075 (the Highway Revenue Act of 1956), Mr. Cooper stated that N.L.A. cooperated with other mineral industry groups in getting the increased taxes on diesel fuel, gasoline, and tires to apply only to highway-type vehicles—not to the off-the-highway vehicles most commonly used in the industry.

"The Advantage of Arbitration" was discussed by John C. Best, recently retired vice-president, National Gypsum Co., Buffalo, N. Y., and director of the American Arbitration Association. Mr. Best defined arbitration as a voluntary submission of a dispute to an impartial party for a judgment; it should not be confused with mediation or conciliation. Major advantages of arbitration over court proceedings include speed (court cases require an average of 16 months for decision, arbitration generally 40 days, never more than 60 days), simplicity (the arbitration panel is not bound by laws or precedence), fairness (the panelists are impartial), economy (because the proceedings are completed so quickly), and finality (the arbitration decision is as binding as a court decision, and can be appealed only on very unusual grounds). In addition, arbitration panelists, in contrast to jurors, number only one or three and are generally experts in the specific cases. There is no written record of the proceeding, and witnesses are not necessarily sworn in.

Mr. Best stated that all cases other than those involving criminals, minors, domestic relations such as divorces, and interpretation of law can be sub-

jected to arbitration. He pointed out that most construction contracts and about 90 percent of labor negotiations are within the scope. Alternatives to arbitration include strikes (in the case of labor disputes), stalemate, or court action—each of which has its disadvantages compared to arbitration. The speaker reported that there are about 13,000 arbitration panel members in the United States.

### Safety

Results of the 1955 association safety contest were not available at the time of the meeting as expected. However, with the results forthcoming shortly, the association plans to present the safety trophies at the Fall Operators Meeting in Springfield, Mo.

In lieu of announcing the winners, Kent Jander, N.L.A. chemical engineer, reviewed the safety record of association members since 1935. A graph showing accident frequency rates over the 20 year period revealed a general improving trend. A record low of 14.3 was attained by participating companies in 1954, which was one half the value ten years ago. This rate is gradually approaching 10—a somewhat ideal value, and this trend is encouraging, he indicated, especially in view of the gradually increasing number of manhours worked each year. Accident frequency rates of related industries in 1954 were given as follows: sand and gravel, 22; crushed stone, 17; chemical, 4.1; and portland cement, 3.4.

Evidence that even greater progress in safety will be made in the future, Mr. Jander said, is that there is an increasing number of inquiries regarding safety and how to set up a safety program. Management has found out that safety pays.

In conclusion Mr. Jander showed a slide relating direct to indirect costs of accidents. Indirect costs, like an iceberg, are largely hidden; these include time lost to employee and supervisor, loss in earning power, failure to fill orders, overhead costs during disruption, etc. He cited one example of a truck backing into a conveyor. The direct cost amounted to only \$12, yet hidden costs brought damages to over \$15,000.

### Panel on Lime-Soil Stabilization

A highlight of the meeting was the panel discussion on various phases of stabilization, including testing procedures, merchandising, competitive methods, and lime's limitations. Conard M. Kelley served as panel moderator. The panel experts were Dr. L. John Minnick, vice-president and chief chemist, G. & W. H. Corson Inc.; J. S. Offutt, merchandise manager, industrial sales, U. S. Gypsum Co.; R. M.



**Clockwise around table:** B. J. Gee, Settle Lime Ltd.; R. S. Boynton, N.L.A.; Yolande N. Rouert, Azbe Corp.; Mrs. N. V. S. Knibbs; Victor J. Azbe, Azbe Corp.; Prof. Walter C. Voss, emeritus, M.I.T.; Mrs. R. S. Boynton; Dr. N. V. S. Knibbs; and Mrs. W. C. Voss

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right outside the window  
but we never lost a teacup!"**

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**Panel on Lime Stabilization.** Left to right: R. M. Slater, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.; Conard M. Kelley, highway engineer, N.L.A.; Dr. L. John Minnick, G. & W. H. Corson, Inc., Plymouth Meeting, Penn.; J. S. Offutt, U. S. Gypsum Co., Chicago, Ill.

Slater, advertising manager, Ash Grove Lime and Portland Cement Co.; and R. S. Boynton.

Using an excellent set of slides, Dr. Minnick described the variety of testing and design procedures used for base course construction. Popular methods of design, he said, include the Texas Triaxial, the Corp of Engineers, the California Stabilometer, and the Kansas Highway Commission. Among the test apparatus illustrated by slides were the Proctor machine, California Bearing Ratio machine, Triaxial compression test, Stabilometer, Cohesimeter (measures shear strength), Resiliometer (measures rebound after load is released), the Sonic method, etc. With the latter method, the base course is subjected to an impulse and the sound transmission is then measured.

Dr. Minnick also described equipment developed in the Corson laboratory for testing the effects of freezing and thawing cycles on soil stabilized with lime-fly ash. He recommended that the producer develop his own tests to fit his own product. Slides were also presented showing the use of lime-fly ash in stabilizing bases for road shoulders; the untreated shoulders

exhibited failure, whereas the lime-fly ash shoulders remained in excellent condition.

J. S. Offutt presented ideas on how to merchandise lime for stabilization. He recommended that the salesman, who in some cases could be a local jobber, first call on the specifying agency within the highway department, rather than on the contractor. Efforts should then be directed in promoting the first trial job. In some cases it may even be advisable to donate a car of hydrated lime for the test section. During the installation, the salesman should stay close to the job, taking photos, getting testimonials, etc. After the specification is made, the salesman can then call on the contractors bidding for the job. Here the selling job may be just as tough, since the specification may call for lime or equal stabilizer. Mr. Offutt also said that the salesman should be encouraged not to expect to sell on the first call; he should also know the limitations of the product. Among major selling points at the present, the speaker said, are the present cement shortage and the economy in using local, often sub-grade materials.

In discussing competitive methods

of stabilization, R. M. Slater pointed out that there are literally hundreds of products besides lime, cement, and asphalt bituminous being studied, promoted, or tried out as road-base stabilizers. Among these are lard (recently tested in Indiana), starch, tung oil, salt, powdered slag, tallow derivatives, all types of resins, castor oil, etc. For some of these products, the stabilization field represents a place of convenient "waste" disposal; for others, particularly those that are presently high priced because of limited usage, it represents a possible fertile market. He indicated that the field is wide open for the industry that develops an economical and durable material which will reduce the soil plasticity and change its shrinkage and swelling characteristics.

Portland cement was reported to be the leading stabilizer, having been used as such for some 10,000 miles of U. S. secondary roads. Advantages include excellent bonding agent (for many soils), excellent protection against freezing and thawing cycles, and reduction of the affinity of soil for water (although it does not impart water repellency to the soil). Mr. Slater indicated that for economic treatment with cement, the soil should be relatively free from organic matter and the plasticity index should be less than 10.

Asphaltic bitumens are also widely used, the speaker said; these supply cohesion for non-mechanically stabilized soils, stabilize the moisture content of granular soils by preventing intake of excess water, and waterproof cohesive soils. The plasticity index should be less than 6 to 10 for best use. The main disadvantage is breakdown under freeze-thaw attack. Calcium chloride, used successfully for surface dust control, has also been used experimentally in road bases. Claims are made that increased density is possible with the same amount of compaction; and that calcium chloride reduces frost action. However, there is some indication that leaching eventually renders the material ineffective. Calcium chloride has been used successfully with limestone fines, but it is not recommended for soils with a P. I. of over 6.

Regarding other stabilizers, Mr. Slater thought that resins will become more competitive as large chemical companies perfect these products. The resin formed by interaction in the soil of a mixture of aniline and furfural has properties of both bonding and waterproofing, and appears to be effective in a wide range of soils. However, high cost and precautions necessary in handling the toxic aniline are disadvantages. Mr. Slater indicated

(Continued on page 138)



**Clockwise, around the table:** Mrs. M. S. Stokes, Batesville White Lime Co.; Philip L. Corson, G. & W. H. Corson, Inc.; Mrs. A. H. Robinson, Jr.; Mr. and Mrs. J. Milton Cooper, N.L.A. tax counsel; A. H. Robinson, Jr., Austin White Lime Co.; Mr. and Mrs. G. E. Robinson, Austin White Lime Co.; R. R. Ruetschi, Batesville White Lime Co.; Dr. L. John Minnick, G. & W. H. Corson Co., Inc.; and Mr. and Mrs. Kent Jander, N.L.A.

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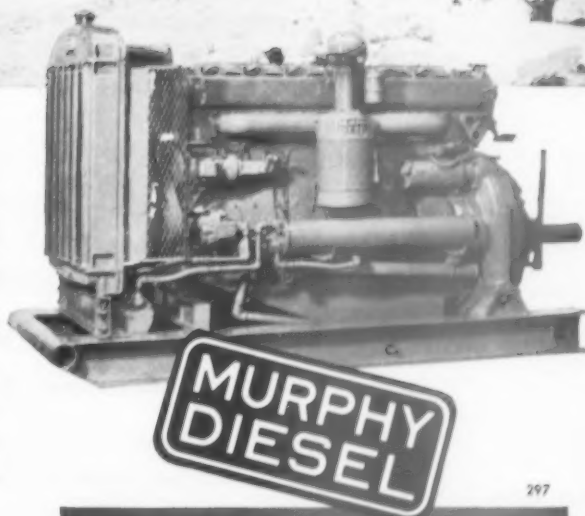


**... turns out over 100 tons of limestone and flint rock per hour**

● From this Kansas pit, W. O. Homer of Junction City, Kansas, is turning out 100 tons of limestone and flint per hour, with flint accounting for about 20% of the total. Mr. Homer is doing this job with a Murphy Diesel powered Northwest shovel and a Murphy Diesel powered Universal portable crushing plant. So it's Murphy Diesel all the way on this job.

If you're looking for dependable output at maximum operating economy, profit by the experience of pit and quarry operators everywhere, and put Murphy Diesel power to work for you. It's your best bet for getting the most rock per gallon of fuel and you'll particularly like the trouble-free service and freedom from costly downtime.

Talk over your requirements with your Murphy Diesel Dealer and ask him to show you what Murphy Diesel power can do for you.



297

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Murphy Diesel Engines and Power Units are available in sizes from 96 to 264 H.P. Engine speeds are 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64-165 K.W.

THE SQUARE KNOT shown is used only to lengthen a trunk line of Plain or Reinforced Primacord — above ground. It must be drawn up tight.



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His holes are laid out in a pattern to obtain the best break-up with respect to the open face, or the most logical direction of the movement of the bank. They're loaded and primed with Primacord, the insensitive detonating fuse. A trunk line of Primacord connects all holes in a planned firing sequence which will promote better fragmentation.

So — he can shoot a few holes or a few acres with one detonator. And he can fire when ready, because Primacord is insensitive to ordinary shock, friction, sparks or stray electrical currents — and even a direct hit by lightning failed to detonate it. Available in Plain, Reinforced, Plastic Reinforced and Plastic Wire Countered.

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*Primacord • Quarrycord • Ignitacord® • Safety Fuse  
Blasting Accessories • Established 1836*

# PRIMACORD

**The Proved and Approved DETONATING FUSE**

# INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

- 1 **CENTRIFUGAL PUMPS**—C. H. Wheeler Manufacturing Co. has published Catalog A-156, describing and illustrating Wheeler-Economy double suction single-stage centrifugal pumps. Cross section drawings and construction details are included for standard sizes up to 10-in. discharge.
- 2 **COLLOIDAL DISPERSIONS**—Acheson Colloids Co., Division of Acheson Industries, Inc., has released a fifth revision of the four-page booklet, "A List of 'dag' Dispersions for Industry," listing 41 colloidal and semi-colloidal dispersions for operational functions, maintenance, lubrication, machine design, etc. Carriers and diluents are given for each product, along with typical applications and physical data.
- 3 **CONCRETE BLOCK TEXTURES**—Light-weight Aggregate Corp. has issued a brochure giving three examples of contemporary design featuring window-walls, bright, colorful interiors, and various uses of textured concrete block. Descriptions of the projects are detailed.
- 4 **CONCRETE COLORS**—Smith Chemical & Color Co. has prepared a color card showing in full color, 22 of its most popular Limeproof Dry Colors, for the concrete products industry. A technical bulletin entitled, "Getting Results with Color in Concrete & Cement Products" is also available.
- 5 **CONCRETE COMPRESSION TESTER**—Formey's Inc., Tester Division, has announced a pocket size slide rule calculator for converting the pressure applied to concrete cylinders and block into p.s.i. Its range is from 0 to 175 tons covering cylinders 3- x 6-in. to 8- x 16-in., and 13 standard modular size block.
- 6 **CONCRETE FORMS**—Irvington Form and Tank Corp. has issued a catalog outlining Atlas Compo Forms for concrete construction. Time and labor saving applications are listed, and typical methods of forming pilasters are illustrated. A complete listing of form accessories is also given.
- 7 **CONE CRUSHERS**—Nordberg Manufacturing Co. has published Bulletin 247, describing and illustrating the operation and design features of standard and short head type Symons cone crushers. The 24-page booklet includes a cutaway view of a crusher installation, tables listing over 40 crushing cavities, diagrams showing flexibility of arrangement for both stationary and portable plant service, and a series of typical application photographs. Specifications are also included.
- 8 **CRAWLER-TRACTORS**—International Harvester Co. has brought out Booklet CR-553-F, giving mechanical features of the International TD-24, TD-18, TD-14, TD-9, and TD-6 diesel crawler tractors. Close-ups of the main features are given, and typical application photographs are included.
- 9 **DUMP TRUCKS**—Yuba Manufacturing Co., C & D Division, has brought out a four-page folder entitled, "Movalls or End-Dump Trucks?" It compares end-dump trucks and positive-ejection Movalls, and is illustrated by on-the-job action photographs.
- 10 **ELECTRIC TOOLS**—Thor Power Tool Co. has published a 44-page universal electric tool catalog, illustrating and describing the line of Silver Line and Speed Tool electric tools for use in the automotive, industrial, construction, maintenance and other fields. A full listing of attachments, accessories and replacement parts available is also given.
- 11 **FIBER CONCRETE FORMS**—Delta Co. has available data on Deltube plastic lined fiber forms for round concrete columns. The body of the tube is constructed of plys of long jute fiber kraft. All plys are bonded with a water-proof adhesive, the outer ply is also asphalt saturated.
- 12 **FRONT END LOADER**—Caterpillar Tractor Co. has brought out Form 31913, a broad-side entitled, "Traxcavator News" describing the features, engineering developments and giving specifications on the No. 977 Traxcavator, a 2¼-cu. yd., 100-hp. front-end loader. The oil clutch and automatic kick-out mechanisms are described.
- 13 **GRINDING RODS**—U. S. Ceramic Tile Co., Diamonite Products Div., has published a bulletin describing and illustrating Diamonite grinding rods for use on ceramic materials, glasses, enamels, chemicals, pigments and pharmaceuticals. Specifications and size diagrams are included.
- 14 **LUBRICATION**—The Alpha Molykote Corp. has published the first issue of a technical house organ entitled, "Lubrication Newsletter," which features a discussion of press fitting with molybdenum disulfide lubrication. Curves show press and shrink fit variables as well as elastic changes in diameters of press fits. The company will add the names of technical persons to its mailing list for the house organ.
- 15 **MASONRY DRILLS**—General Electric Co., Carboly Dept., has brought out a table giving recommendations for using carbide-tipped masonry drills for maintenance work. The recommendations include speeds, drill sizes, and pressure requirements for applying the masonry drills in piercing cinder and concrete block, brick, various tiles and stones, as well as marble.
- 16 **MECHANICAL DRIVE TURBINES**—General Electric Co. has published Bulletin GEA-6232, describing high speed mechanical drive turbines, which operate at speeds ranging up to 10,000 r.p.m. and higher. Construction and design features of turbine drives for centrifugal compressors and blowers are covered, and cross sections, schematic drawings, cutaways, and typical installation photos point out design features and applications. Steam rate tables and curves are also included.
- 17 **METAL ALLOY CASTINGS**—Stoddy Co. has published the second edition of its 15-page booklet entitled "Stoddy Castings." The use of hard metal castings is described, and types of available castings, ordering information, and the manufacturing process used in the castings are discussed. Photographs of current specimens are also given.
- 18 **MOTORS-GENERATORS**—General Electric Co. has issued Bulletin GEA-6355, a 12-page booklet, describing and illustrating Kinamatic d-c motors. Data are given on electrical and mechanical features, versatility of the standard line, maintenance features, dimensions and ratings. Also available is Bulletin GEA-6461, a six-page booklet, illustrating and describing Kinamatic generators in sizes of ¾ to 100 kw.
- 19 **MULTIWALL BAGS**—St. Regis Paper Co. has brought out a series of manuals entitled "The Man From St. Regis," designed to aid in solving packaging problems. Handbooks issued thus far include a palletizing manual, a multi-wall bag papers manual, and a printing manual. Each of the manuals is illustrated with charts, photographs and drawings.
- 20 **NEOPRENE**—E. I. du Pont de Nemours & Co., Elastomers Division, has prepared a 12-page booklet entitled, "A Neoprene Sample Case," describing and illustrating the variety of applications where neoprene has been used. An outline of neoprene's resistance to deterioration by oil, ozone and weather is given, as well as specific examples of how it is used in brake diaphragms, gaskets, ignition wires, hoses, couplings, etc.

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- 21 **PALLETIZED HANDLING** — American Road Equipment Co. has published a pamphlet entitled "Why Palletize," pointing out the advantages of palletizing to cut material handling costs. The American Econobile 600, a heavy-duty, high lift hydraulic loader is also described and illustrated for use in palletizing operations.
- 22 **PLASTIC COATED WIRE ROPE** — Macwhyte Co. has issued a circular, No. 5610, giving specifications and data regarding proper use of its plastic coated wire rope, which has strengths ranging from 480 to 7000 lb. Minimum safety factors, sheave and drum diameters, and tread pressure formulas are also included.
- 23 **POLYPHOSPHATE APPLICATION** — Victor Chemical Works has published Technical Service Bulletin No. V1-53, describing the application of polyphosphates in the cement industry. Topics covered include deflocculation of raw cement slurries, nature of raw cement slurries, laboratory examination of slurries, and effect of deflocculating agents, illustrated by means of tables and graphs.
- 24 **PORTABLE MIXER** — Master Vibrator Co. has published a catalog describing and illustrating a portable electric tub mixer for plaster and mortar, designated the "Handy Mixer." A comparison chart illustrates the mixer's advantages, and a complete list of specifications is given.
- 25 **PRECAST CONCRETE** — Flexicore Co., Inc., has released a four-page booklet describing and illustrating the construction of one-story commercial buildings on which Flexicore precast concrete flooring and roofing were used. Tips on structural, finish and wiring advantages are given.
- 26 **RAILROAD SWITCHER** — LeTourneau-Weittinghouse Co. has announced a bulletin entitled, "SwitchMobile—diesel railroad switcher on rubber tires," which gives data on the SwitchMobile and SwitchTractor, both rubber tire mounted. Typical application photographs are included.
- 27 **REAR-DUMP TRUCK** — General Motors Corp., Euclid Division, has released an eight-page catalog describing the R-15 rear-dump truck with a rated payload of 15 tons, with standard 14.00 x 24 tires, and 18 tons with optional 16.00 x 25 tires. The major design and operating features are illustrated and performance data and general specifications are given.
- 28 **RECORDING, CONTROLLING INSTRUMENTS** — The Bristol Co. has published a 64-page bulletin, No. P1245A, covering Dynamaster electronic potentiometer and bridge instruments for recording and controlling. Full specifications are listed for the various models, and details of the instrument and its components, as well as the principles of operation are given. Sensing elements and special attachments are listed, and various equipment in which Dynamasters have been incorporated are listed.
- 29 **RIPPER** — Caterpillar Tractor Co. has issued Form 31872, a broadside explaining the advantages of the No. 8 tractor-mounted ripper, and defining "live drive." Complete specifications are also listed.
- 30 **ROLLER BEARINGS** — Link-Belt Co. has announced Book No. 2658, describing the features of Series B, adjustable single-row self-aligning roller bearings; Series D, adjustable double-row bearings; and Series M, pre-adjusted double-row self-aligning bearings. Dimensional specifications, recommended fitting practices, and engineering selection data are given.
- 31 **SAFETY** — National Safety Council has published a booklet entitled, "Have a Good Time," illustrating and describing how to have a safe vacation. Drawings illustrate safe rules of driving, swimming, camping and other vacation activities.
- 32 **SECTIONAL BELT CONVEYORS** — Link-Belt Co. has released an illustrated eight-page book, No. 2579, describing Pre-Bilt sectional belt conveyors in standardized, pre-engineered units with capacities ranging up to 1500 t.p.h. A line drawing illustrates standard components available to meet individual requirements. A selection chart and typical application photographs and descriptions are also given.
- 33 **SKID-SHOVELS** — International Harvester Co. has published Booklet CR-407-F, illustrating and describing the International Drott Skid-Shovel. Advantages are listed and described, and the use of various attachments is also discussed.
- 34 **STEEL STRAPPING** — Signode Steel Strapping Co. has issued the Spring, 1956, issue of "The Signode Seal," featuring articles on developments in handling and unitizing block, etc., and tying forms in concrete construction.
- 35 **TELESCOPIC HOISTS** — Galion Allsteel Body Co. has brought out Catalog LL-3059, describing and illustrating a line of truck-mounted telescopic hoists. Condensed specifications, cut-away illustrations of the telescopic cylinders and roller bearing hydraulic pump, and action photos of the single and twin cylinder front mounted hoists are given. Model NF series dump bodies, for use with Uni-scope hoists, are also illustrated and described.
- 36 **TORQUE CONVERTERS** — Twin Disc Clutch Co. has issued Vol. 18, No. 1, of "Production Road," featuring a story entitled "The Trend is to Torque Converters in the Construction Industry." The magazine also gives tips on efficient power transmission for powered equipment users. On-the-job photographs and charts are included.
- 37 **TRACTOR REPLACEMENT PARTS** — Caterpillar Tractor Co. has prepared Form 31909, entitled "Pedigreed Parts," describing the engineering and research which go into the manufacture of Caterpillar parts. Examples of research and testing operations are given, such as how the fuel spray pattern in fuel injection equipment is studied; gauge-testing track shoes on concrete; and testing steel for track rollers.
- 38 **TRAILERS** — Fruehauf Trailer Co. has brought out a brochure covering latest developments in its dump trailers, carryalls, bulk cement handlers, platform units, pole trailers and many other types. Each unit is illustrated with a description of the unit and its application.
- 39 **V-BELTS** — Worthington Corp., Mechanical Power Transmission Sales Dept., has released Bulletin V-1400-B20-P, illustrating and describing Worthington-Goodyear types of V-belts available for heavy industrial drives and miscellaneous light machinery drives.
- 40 **VARIABLE SPEED DRIVES** — Allis-Chalmers Manufacturing Co. has issued Booklet 20P50, a 44-page brochure, featuring multi-color tables for selection of variable speed "Texrope" drives. Data is included on design features, drive principles, horsepower rating tables for A, B, C, D, and E section belts, and a speed range table shows the r.p.m. variations when using two Vari-Pitch sheaves in combination. Accessory equipment for the Vari-Pitch drive is also listed.
- 41 **VIBRATING SCREEN ENCLOSURES** — Allis-Chalmers Manufacturing Co. has released Bulletin O7B8423, describing Model AVS and Model B dust-tight enclosures for floor-mounted vibrating screens. Photographs are used to point out the various advantages and features.
- 42 **WELDED CHAIN** — Republic Steel Corp., Bolt and Chain Division, has issued Form ADV-701, a 62-page catalog describing and illustrating over 25 different types of welded chain and chain assemblies, plus a complete line of accessories. Suggestions for measuring and ordering chain are included, and care and maintenance details are given.

**Detach and Send Us This Post Card!**

ROCK PRODUCTS, 79 W. Monroe St., Chicago, Ill. (RP 6-56)

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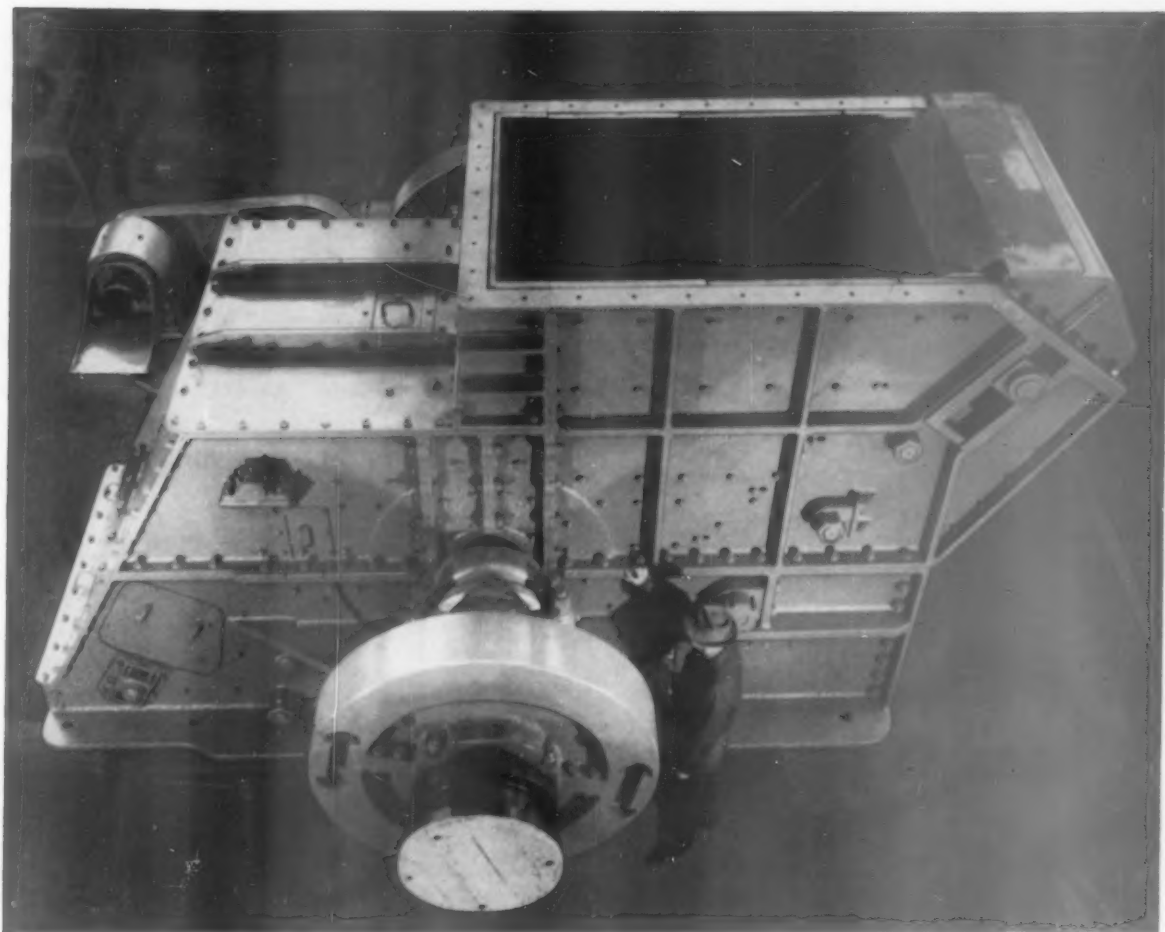
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## **LARGEST NON-CLOG HAMMERMILLS EVER BUILT** satisfied customer orders another

The 7260 Pennsylvania Non Clog Hammermill shown above is the third one of these crushers one of our customers has bought. The first two machines are giving fine service and have been for several years, so when a particularly tough crushing problem of sticky, wet feed came up at another plant, the operator called in Pennsylvania engineers to design and build a special crusher to meet specific conditions. The building of special crushers to fit individual needs has long been a large part of Pennsylvania business. In over fifty years of designing and building crushing machinery, Pennsylvania has accumulated know-how and experience that can't be

duplicated. This practical experience and the ability to design and manufacture the custom built special crusher is at your service. Use it on your next tough problem. It pays to buy crushers from Pennsylvania whether it's a special job or the usual.

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### **PENNSYLVANIA CRUSHER DIVISION**

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## MODERN BUSINESS



## AND MODERN SCHOOLS



## NEED EACH OTHER MORE THAN EVER!

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Only one thing. Will the labor market keep pace?

That's where schools are important. If your company isn't helping community groups to get modern schools, it's not apt to get the skilled people it needs. Self interest, civic spirit, or both, you should make schools your business, too.



Want to find out how to help in *your* community?  
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D-139



## **"ALL AMERICAN" Portable Crushing and Screening Plant**

# **...outproduces every machine in its class!**

Hourly records of 300 to 400 tons of road gravel in 25% to 35% crush are repeatedly reported wherever a Diamond 77 works. Substantial tonnages are obtained even where extremely hard rock is processed.

This high productivity has been achieved through shorter material flow and oversize units, without increasing weight of machine. Its capacity and speed will equal and often better those of bigger plants.

Featuring primary and secondary crushing through the Diamond Rotor-Lift, Line Flo system, the "77" uses a 10" x 36" Jaw Crusher and a 36" x 22" oversize star gear Roll Crusher. This combination, together with a 4' x 12', 2½" deck Vibrating Screen and 30" wide Conveyor Belts, provides continuous and fast flow of material without bottlenecks.

Moves from one working location to another are accomplished with a minimum of down time. A hydraulically operated mechanism lowers the screen deck to travel position in a fraction of the time required for manual knockdown.

*Ask for Catalog D5415 for full description.*

### **DIAMOND IRON WORKS**

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#### **GOODMAN MANUFACTURING COMPANY**

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#### **Everything For The Aggregate Producer**

Jaw Crushers • Roll Crushers • Conveyors • Screens  
and Washers • Feeders and Bins • Portable and Sta-  
tionary Crushing Plants For Rock and Gravel

Patent Applied For

# CUT COSTS STILL FURTHER

on hardrock mining jobs

with **ESCO "WEAR-CAP" ADAPTERS**



## Replaceable wear-caps resist wear, protect point adapter for longer life

Now you can cut yardage costs on point adapters—just like you now do with ESCO points—with the new ESCO Wear-Cap Adapters. ESCO Wear-Cap Adapters save you time and money because you replace only a slip-on wear-cap instead of the entire adapter. The Wear-Cap protects the shock-resistant adapter and is hardened to resist wear—just like the digging tip of an ESCO point. Cast of wear-resistant ESCO 12M Steel, Adapter and Wear-Caps are designed specifically for large shovels working on extremely abrasive jobs such as hardrock or strip mining jobs with a heavy overburden.



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ESCO International—New York Office

at 420 Lexington Ave., New York City,  
or Portland Manufacturing Plant

In Canada

Vancouver, B.C. and  
Toronto, Ontario

## LIME CONVENTION

(Continued from page 130)

that many other resins, used alone, or in combination, are continuously being made available for tests; others, like "Stabinol," have been heavily promoted, then discontinued.

Unlike competing stabilizers, Mr. Slater pointed out, lime stands alone in the way it accomplishes stabilization, i.e., in its ability to react with the colloidal clay fractions of the soil to change its physical characteristics and to form a binder of definite cementing properties. Whereas cement, asphalt bitumens, and other stabilizers are recommended for soils with a P. I. of less than 10, lime has been successfully used to stabilize soils with a P. I. as high as 45. Thus, lime is especially useful for the highly plastic clays — soils which ordinarily are trouble makers. The speaker explained that lime, with the addition of water, improves the working condition of a clay soil by disintegrating lumps into sand-size particles which aid mixing and compaction. Another advantage is lime's recuperative cementing action with clay particles, which prevents permanent damage to the base due to the crushing effect of early traffic overloads.

A disadvantage of lime stabilization, however, is its poor laboratory performance under freeze-thaw tests. Competition has capitalized on this feature. However, Mr. Slater pointed out that field performances have indicated much higher durability than reached in the laboratory tests.

Since lime stabilized soils are subject to abrasion, the speaker said that they should be sealed soon after compaction to assure the retention of optimum moisture in the base and to maintain a surface condition that will bond with the sealer.

In conclusion, Mr. Slater pointed out that every soil is different, and consequently much research in soil mechanics will be needed to determine which chemical or bonding agent will most successfully stabilize any given soil.

Mr. Boynton, in discussing lime's limitations, pointed out that lime is not a cure-all in stabilization, and consequently should not be overpromoted. One bad installation can counteract 10 good jobs, he emphasized. One major limitation is the fact that not all soils can be stabilized effectively with lime. Consequently, laboratory and field tests should be performed to determine both the advisability of using lime and in what proportions.

For sandy friable soils, lime should never be used alone; fly ash or some

(Continued on page 140)



## 4032 GROSS TONS PRODUCED DAILY!

SUPPLYING BLAST HOLES for three different quarries, the "down the hole" Depthmaster drill of the DRILLMASTER shown above is drilling limestone at a rate never before thought possible.

The formation is hard and very abrasive. Yet on a 50-foot face, the operator is sinking 180 feet of 6-inch holes per shift—on a 15-foot hole spacing pattern and 18-foot burden. That represents 4032 gross tons a day!

The Depth-Master "down the hole" drill actually goes down the hole with the bit. Applying full drilling impact directly to the bit, it eliminates the power losses in long drill steels. You can use the three-way DRILLMASTER also as a Rotary drill or as a Power-Master "out of the hole" drill.

Complete DRILLMASTER tower and accessories are available for tractor or truck mounting. For further details, write for Bulletin 4179.

5-387



**Ingersoll-Rand**  
11 Broadway, New York 4, N.Y.

ROCK DRILLS • COMPRESSORS • AIR TOOLS • TURBO BLOWERS • CONDENSERS • PUMPS • OIL & GAS ENGINES

ROCK PRODUCTS, June, 1956

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## LIME CONVENTION

(Continued from page 138)

other pozzolan is also needed. Construction during or in advance of freezing weather should be avoided. The base course should be topped soon after curing and should not be used as a wearing surface. Moist curing coupled with application of asphalt emulsion is recommended. Good workmanship is also a must; this comprises thorough soil pulverization, mixing, and compaction. Another caution is to use sufficient lime on the finer grained soils; e.g., 5, 7, or 10 percent for soils containing more than 50 percent of combined clay and silt.

The speaker also suggested that the industry at this time avoid injecting the controversy of high calcium lime vs. dolomite lime for stabilization. Actually, he said, both types of lime have performed satisfactorily.

In the question and answer period, Mr. Kelley said that mechanical mixers do a better job of mixing than graders. Bulk lime is generally used on large jobs, bagged lime on smaller jobs. He called for better methods for handling lime from the plant to the job; dusting and burning are two major problems.

Management of expanding enterprises was the subject of an address given by Dr. Robert Pflaumer, president, American Marietta Corp., Chicago, Ill. He pointed out that intense competition during the expanding post-war decade has led to development of innumerable mergers. By effecting

these mergers, companies have been able to develop better research programs, to finance large expansion programs (since bigger companies have better credit), and to diversify. The latter policy had been adopted as insurance against localized depressions.

Mr. Pflaumer explained that American Marietta — one of the nation's most rapidly growing enterprises—has developed a pattern of management leadership based on what he termed "autonomous decentralization." The home office serves as consultants or administrative planners to the operating divisions and exercises financial or budgetary control over these divisions; it also carries out a consolidated research program. Responsibilities are delegated to the decentralized divisions, with each division operating as a separate profit making body. To coordinate these multiple operations, the home office has developed an efficient master reporting system which lists such items as status of sales orders, etc.

Besides serving as administrative planners, management also has a social responsibility to its employees, Mr. Pflaumer emphasized; the job isn't purely a mechanical one. Summarizing, he listed four factors for management of enterprises to consider: scope of each division, degree of autonomy, extent of self containment, and resolving of relations between the divisions.

### Lime Research and Uses

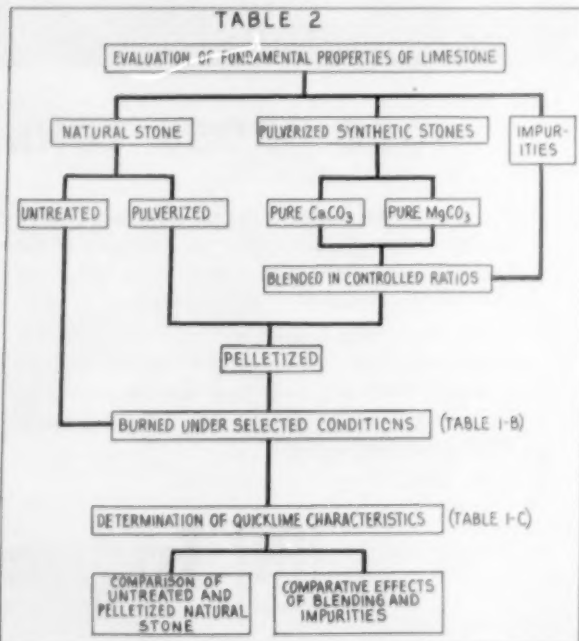
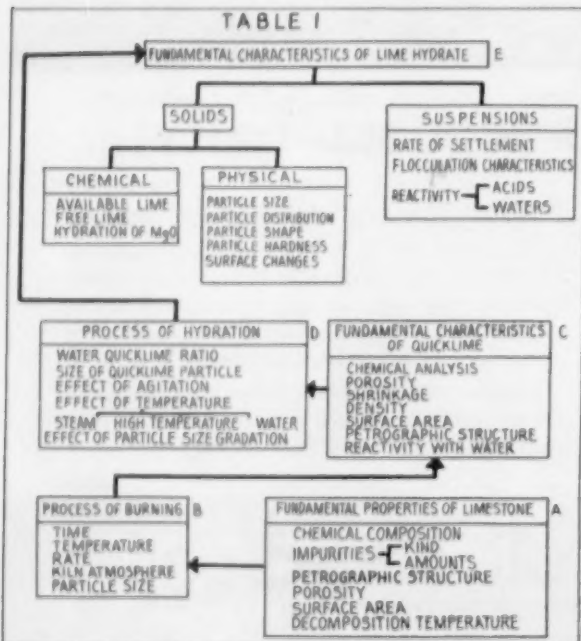
"The Truth Will Out" was a title of a stimulating paper by Walter C.

Voss, professor of building construction, emeritus and lecturer, M.I.T., and consultant in architectural construction and materials, Cambridge, Mass. Prof. Voss pointed out that through scientific research, basic truths have been developed and have won out over prejudices and standpat attitudes. Progress through research, he said, has enabled the lime industry to regain its rightful place in many fields. Reference was made to a quarter century of research activity on building limes carried on at M.I.T. for the association. These findings have led to the gradual movement from rigid cement mortars to less rigid high-lime mortars, and have forced the cement industry to vary its masonry materials, with some resorting to what he termed "the subterfuge of adding ground limestone."

One specific research project cited involved the question of rupture of masonry work by mortar expansion due to chemical reactions. Professor Voss used graphs showing mortar expansion curves for various mixes of cement, lime (several types), and sand; these curves, he said, clearly illustrate the fallacy of applying empirical test requirements indiscriminately. He also presented a color movie made at M.I.T. which demonstrated the principles involved in masonry rupture. The movie showed that use of rigid mortars and dense brick is undesirable.

In conclusion, Professor Voss proposed that the industry launch an ex-

(Continued on page 164)



Tables 1 and 2: Outline of research program concerning fundamental nature of limestone and lime proposed by Prof. Walter C. Voss

# In New Jersey ... And the World Over Experienced Quarry and Mining Men Choose Bucyrus-Eries for the Really Tough Jobs

When digging is really tough, like in the solid rock at this northern New Jersey quarry, experienced men put a Bucyrus-Erie shovel on the job. The Bucyrus-Erie 110-B with 4½-yd. dipper on this job keeps a fleet of trucks busy maintaining a steady flow of rock to the quarry crushers.

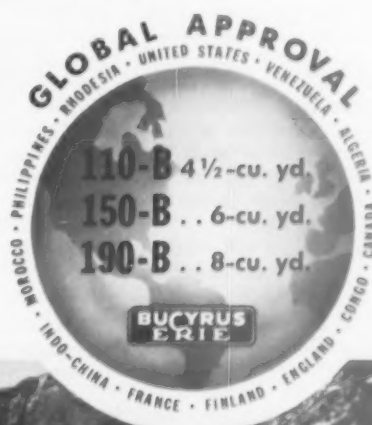
The superiority of Bucyrus-Erie front-end design, extra-strong construction, Ward Leonard electric control and advanced engineering

is recognized the world over. For that extra margin of performance that means higher output at lowest cost per yard, put a Bucyrus-Erie to work on your jobs.

64155

## BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin



Ward Leonard control on this 110-B eliminates clutches and brakes in operating cycle. As the operator of this machine says, "This is the easiest and smoothest to operate of any large capacity shovel that I have ever run."



## Recent Technical Developments In

# PROCESSING SLAG PRODUCTS

By B. M. PEARSON

### Part 3. Preparation of lightweight slag products for the building industry for use as concrete aggregate and insulation

**I**N THE BUILDING INDUSTRY, lightweight porous foamed slag is assuming an increasing importance as an aggregate in the manufacture of concrete block and slabs. The advantages of this product for building construction are well known. These are the low weight relatively per volume and the associated thermal insulation characteristics. Increasing demand for porous foamed slag has led more steel works to install plants for its production.

Foamed slag manufacture started some 40 years ago and was conducted directly at the blast furnace. The slag

was run out of the slag spout directly into the foaming spout and later to the foaming wheel or similar foaming equipment. This had the advantage that the slag was very hot and a large part of the slag produced could be foamed. Because of the high slag temperature and the low viscosity, the slag bloated up very actively so that a very light slag pumice was formed with volume weights of 250 to 450 kg./cu. meter. This product is an outstanding insulating filling material on the basis of its low thermal conductivity.

The disadvantage of the light slag

pumice, however, is that it does not have a very high grain strength. As the content of the relatively big air bubbles is large and the wall thicknesses of the air cells are small, collapsing of the grains occurs during the processing. This has led to the production of a slag pumice with a smaller surface and a grain with a higher crushing strength to attain higher concrete strengths with the same cement content; i.e., the slag does not need to be excessively foamed.

As the foaming characteristic depends principally on the temperature, it signifies that a somewhat cooler

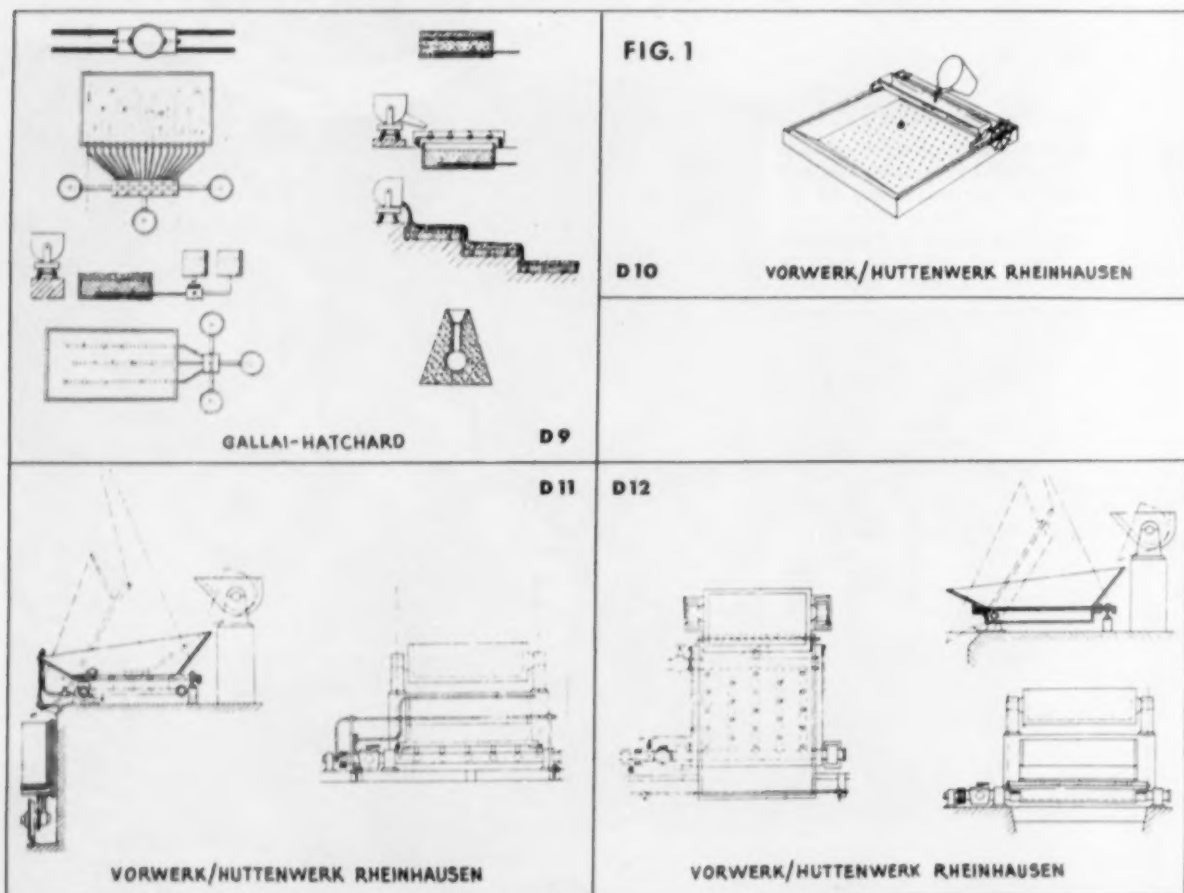


Fig. 1: Layout arrangements for production of expanded slag on the bed foaming principle in mass bulk.

Thursday, April 5, 1956

# GENERAL REFRACTORIES

slag must be taken for the foaming. The requirement for a strong-grained slag pumice, with a higher volume/weight figure, can be undertaken without any difficulty by steel plants which are erecting new slag-pumice installations.

An installation of this type, particularly the necessary crushing and classification equipment requires considerable floor space. This space is generally unavailable in the immediate vicinity of the blast furnaces so that these installations must be erected at a greater distance from the blast furnaces. There still remains the possibility that the foamed slag can be produced at the blast furnace and then passed for further processing to the crushing and screening plant. For operational reasons, however, this is not always easy as the foamed slag is bulky and requires considerable transporting space and it is still hot at the moment of production and takes considerable time to cool off.

It can be cooled by sprinkling with water but this method increases the portion of sand which is always formed. Intermediate storage at the blast furnace, therefore, remains the only alternative, however; this generally is not possible because space is lacking and in addition the cost of the end product is increased. It is much simpler to run the slag out into the slag ladle and produce foamed slag only in the processing layout.

This process is naturally associated with difficulties: these lie principally with the temperature losses during the stand-off periods. On the other hand, there is the operational advantage that one is not confined to slag production from any one particular blast furnace at which the foaming equipment happens to be located but any suitable foaming slag from a concentrated layout of blast furnaces can be used.

As the slag on arrival at the foaming installation will have lost 100 deg. C. or more in temperature, it will naturally not foam so strongly as at the blast furnace. A finely porous material is formed which is certainly somewhat heavier but is actually much stronger in the grain.

#### Strong Grain Properties

By obtaining the advantage of grain strength with the foamed slag, the disadvantages of a higher volume/weight and accordingly a somewhat lower heat insulation characteristic than the lighter pumice slag has to be accepted. So much will depend upon the actual application that it is difficult

to say in a hard and fast manner as to which type of foamed pumice slag is the better; the lighter type with a volume/weight of about 400 kg./cu. meter or the strong grained type with a volume/weight of about 750 kg./cu. meter. It is a question rather more of using both these types for various uses, according to their characteristics.

Where good heat insulation characteristics are required, then the preference will be given to the lighter pumice slag; in those cases where strength is the outstanding consideration, then the strong-grained pumice slag is the better material to use. If the weight is not a decisive factor, then it is more favorable to use a stronger grained pumice slag and to save cement in the subsequent mix. Although the stronger grained pumice slag is heavier, it does not necessarily follow that the slabs or concrete produced of the same dimensions will be heavier. It is a question here very much of a suitable grain composition so that the volume/weight of the lightweight concrete will be determined by the porosity of the grain.

#### Sulfur Content of Slag

The sulfur content of blast furnace slag, in the case of a foamed slag product, also plays a role. This material, of course, is used exclusively in building construction, and discussion often occurs as to the harmful effects of the sulfur contained in the slag. The opinion is frequently expressed that the sulfur, which is mostly combined as sulfide, can be oxidized to free sulfuric acid and damage to steel or other metal inserts may result. It is further assumed also that the calcium sulfide present would be oxidized to calcium sulfate and could then lead to gypsum swelling in the concrete. These opinions, however, are based on bad experience with the older type, unsatisfactory slags.

This has served to restrict the use of slag to quite an extent. Detailed investigations have been conducted in this direction, the results of which have been confirmed further by practical experience. On the basis of the good experiences which have been obtained with the blast furnace cements, the German portland cement plants\* are now producing more blast furnace slag cement than the iron and steel works. Doubts still exist, however, with the use of blast furnace slag as an aggregate for reinforced concrete construction. However, tests which were conducted at the Berlin-Dahlem Material Testing Station (Stahl und Eisen, vol. 37 pp. 616-632) clearly served to show that blast furnace slag has no influence on the rusting of steel in concrete. If rust appearances have

been noticed with reinforced concrete construction when slag pumice has been used as the aggregate then this can be ascribed to unsatisfactory imbedment of the reinforcing.

#### Slag Bed Foaming System

One of the most important developments in expanded slag within recent years has been the bed foaming system. This is quite a revolutionary departure from all previous foaming procedures for producing expanded slag, where the slag is treated in relatively small quantities, either on a slag foaming wheel or on a foaming conveyor. These methods are all in operation with more or less success but they are imperfect from the viewpoint that they are only capable of treating an easily foamed slag; those slags that could not be dealt with in this way were termed "unfoamable" and not treated. This conception of foamable and unfoamable slags spreads all over the world. The great advantage of the bed foaming system is that all types of slags are capable of being processed to produce a good foamable product. With the bed foaming method, many tons of slags are treated simultaneously to produce a good, expanded slag product.

The Giller foaming wheel, which was used by the German Vereinigte Stahlwerke, worked fairly effectively but the drawback of this process was the fact that the volume occupied by the expanded slag necessitated very large and deep collecting pits, and the great drop of the expanded slag from the wheel into the pit led to the destruction of a large proportion of the cells due to the impact with which the slag reached the bottom of the pit. These plastic masses then caked together into huge solid, heavy lumps which were quite useless. To overcome this, a long foaming conveyor was conceived and then followed a combination of the foaming wheel and a cooling-handling conveyor. This system permits a good start of foaming on the wheel and completion of the process on the conveyor, preventing the material from being dropped from the wheel more than a foot or so, feeding both wheel and conveyor with water. This system produces from a well or reasonably well foamable molten slag, a satisfactory quality of expanded slag. This system is still widely used, but the drawbacks of all these mechanical slag foaming processes are as follows:

(1) They are based on a continuous and limited flow of molten slag either direct from the tapping hole of the blast furnace or from the slag ladle.

(2) They are all constructed from

(Continued on page 146)

\*Production of Strong Grained Foamed (Expanded) Slag: G. Zwilling: Stahl und Eisen, vol. 72, No. 9, pp. 500-502.



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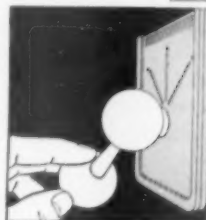
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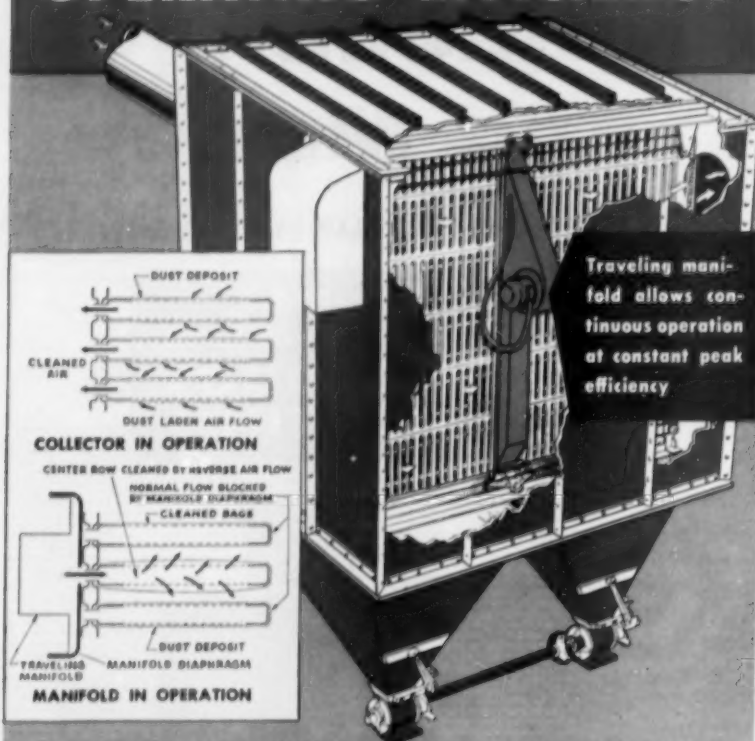


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### CONTROLS DUST

## SLAG PRODUCTS

(Continued from page 144)

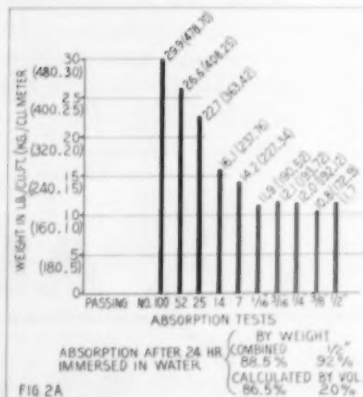
metal, resulting in high and in many instances, excessive maintenance costs and stoppages in production.

(3) These processes have created all over the world the idea that there are foamable and unfoamable slags. It is claimed with them that a nice light expanded slag is produced, but it would be more correct to say that these processes are capable only of foaming a well-foamable slag which can only be light.

The first work on the bed foaming system for expanded slag was started in 1912 by Schol. It was proposed first to wet a layer of sand and then to pour molten slag over it. The process, however, was a failure and was abandoned until 1943, when it was revived and improved to a satisfactory working state. The trouble with the original Schol process was insufficient water in the damp sand bed to foam the slag successfully. Gallai-Hatchard, who developed the process to success, found that when additional water was supplied from below, the process worked. Experimentally, there was imbedded in the sand bed a 1-in. pipe, the end of which was bent upwards and the pipe was positioned in the center of the 30 x 30-ft. sand bed. The sand bed was sprayed, the ladle poured over the whole bed and the water supply turned on over the 1-in. bed. The result showed in the center of the bed a most violent foaming activity with an impressive "growth" rising; all around this growth the slag expanded as formerly in the form of a poor honeycomb. When this growth was examined it was found to consist of perfect foam. The slag used, incidentally, was derived from a source which had been previously classified as unfoamable.

The theory of the expansion process

(Continued on page 148)

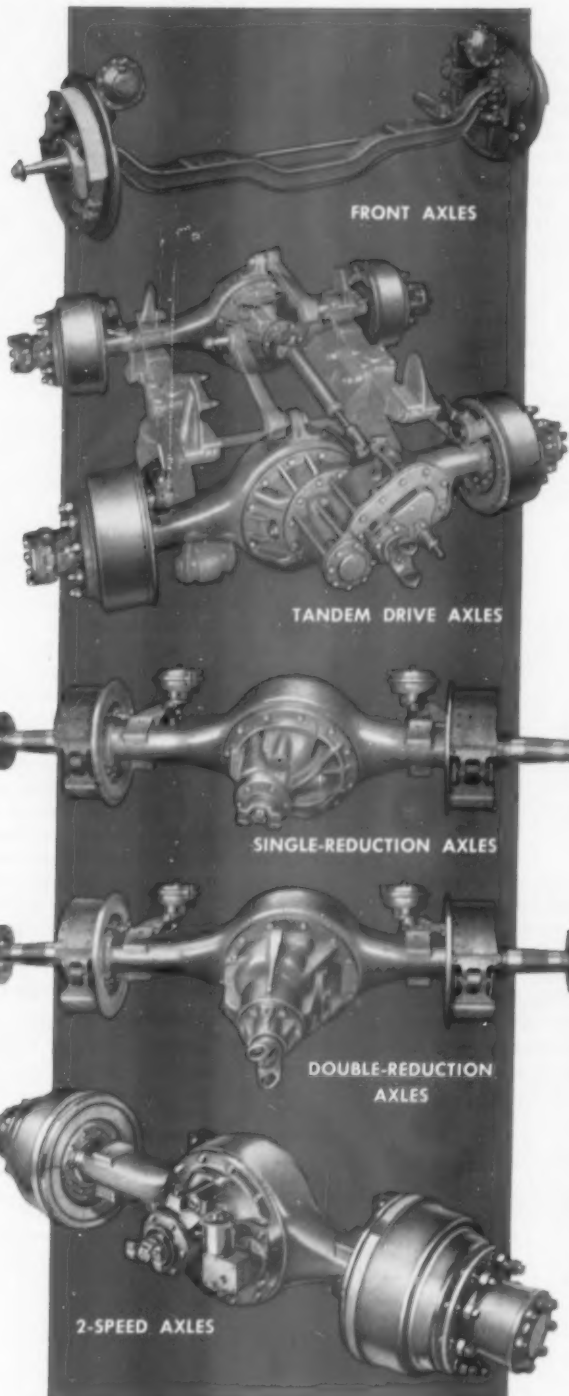


**Fig. 2-A:** Loose bulk density of feather-weight foamed slag

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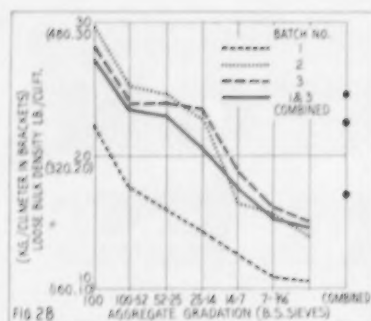


Fig. 2-B: Bulk density of individual fractions of featherweight foamed slag aggregate

is that the comparatively small supply of water had been turned into steam instantaneously which had become enclosed and trapped under the great weight of the slag carpet without a chance to escape sideways and then being super-heated violently in fractions of a second, reached a degree of pressure which just had to penetrate into the highly viscous, molten slag carpet. The trapping of the steam for doing the work had never been thought of before. It also would not have been possible with mechanical foaming means because, based on a steady flow of molten slag, only comparatively small quantities of slag were treated within every second. This did not allow any trapping because the steam always took the way of least resistance. If the slag was highly fluid, it was easier to penetrate into it and expand it. If it was a tough, highly viscous slag, it was easier for the steam to escape sideways, thus creating the idea of "unfoamability." The basic idea of success with the bed foaming method was to harness the steam, hold it down by the weight of large quantities and to force it by trapping, to do its work of penetrating and thus expand the molten slag.

Successive tests and a great range of various trials ultimately led to the present form of the foaming bed, constructed of various types of concrete, in which is imbedded a large network of pipe, a multiplicity of jets, with the most perfect water control. The main principles of the bed foaming layout are shown at D9 in Fig. 1. The plant controls all jets simultaneously or groups of jets separately thus being able to produce on one and the same bed simultaneously, different qualities which are then blended. This feature is called selectivity.

With the operation of this bed foaming unit, further developments were obtained from operational observation. It was found to be a fundamental mistake to pour the slag relatively slowly onto the bed. It was

found that the ladle must be tilted with a jerk so as to effect efficient trapping. It was found that with previous slow pouring of the slag onto the moist bed, it started to rise and expand immediately the first quantities reaching the bed, and the many tons of molten slag following destroyed the cellularity of this semi-fluid plastic foam. The sudden tilting of a complete ladle content of slag is considered by Gallai-Hatchard as one of the most important features of the bed foaming process which led ultimately to the successful foaming of slags which up to now, had been regarded as unfoamable.

### Control of Foaming Conditions

Another important feature was the harnessing of the plasticity of the slag

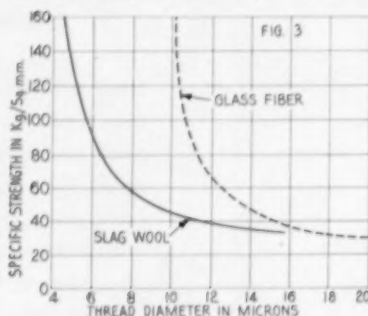


Fig. 3: Specific strength of slag and glass fibers in relation to the diameter (P. A. Koch)

in its status nascendi. Up to now, the plasticity, although recognized as existent, was looked upon as a disagreeable feature which had to be put up with. On a foaming bed, however, dealing with the complete contents of ladles of whatever size, plasticity is controlled and can be utilized to make a satisfactory product out of slags which would be much too light with

a machine foaming process. This is a question of bed design.

The fact that on a bed the slag foams up and remains entirely undisturbed while and after it has been foamed, proved a great asset for achieving ideal, uniform cellularity.

Yet another feature was the possibility for uniform annealing and hardening which is effected by leaving the large mass of the thick, foamed carpet on the bed in full glow as long as desired. In mechanical foaming which deals with small quantities of slag at the time, this cannot be even approached.

Summing up, the foaming bed system ultimately developed into a rapid, mass production method in which the actual foaming of any quantity contained in a ladle can be accomplished in seconds. Although mass production sometimes lowers the quality of the product, producing foamed slag on the foaming bed gave a degree of close control over the quality of the product through selectivity of controls which no other system can achieve. It also widened the field of foamability to blast furnace slags which had hitherto been considered unfoamable.

A further later development of the slag foaming bed was the discovery that after the material has been annealed, it can be split and broken up within a few minutes by a water treatment, utilizing the same means with which the foaming was achieved. By this method, the cost of a crushing plant and the former crushing operation can be reduced considerably.

### Rapid, Self-Emptying Bed Design

To clear the foaming bed after the foaming is finished, can be accomplished in various ways. The best

(Continued on page 152)

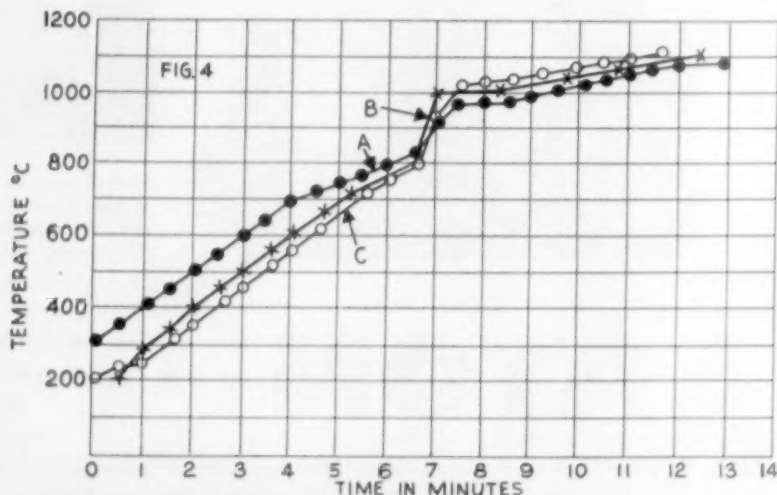


Fig. 4: Heating curves of vitreous slag wool

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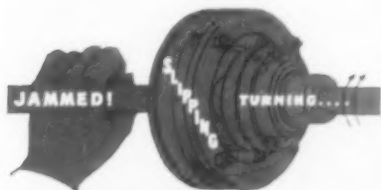


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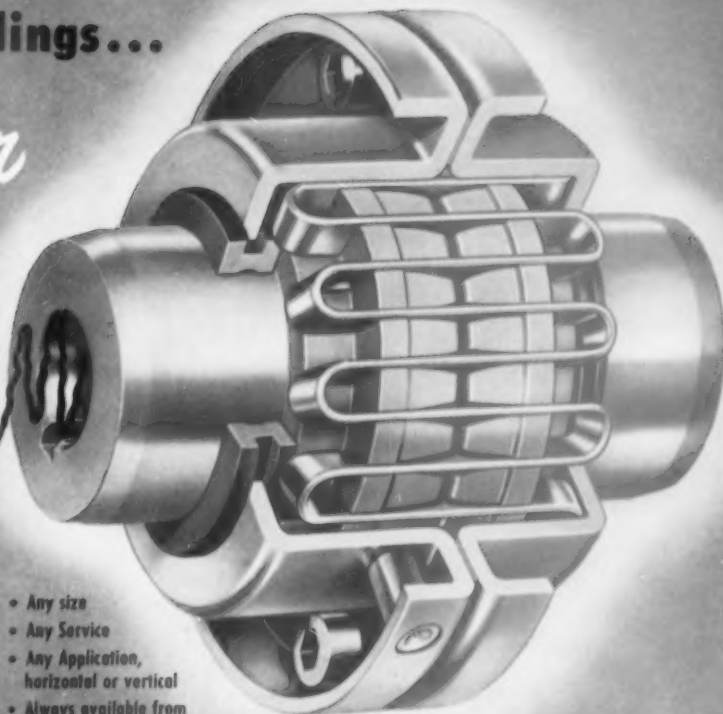
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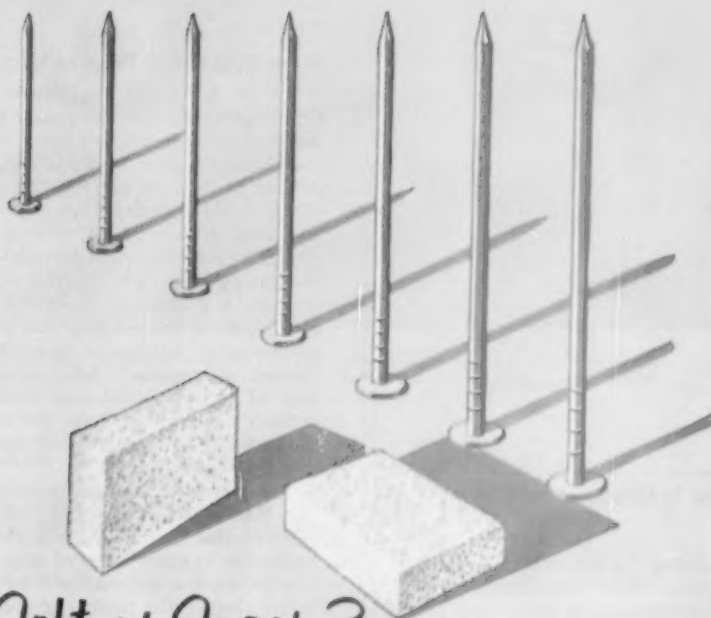
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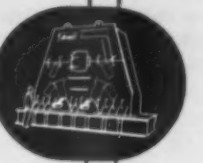
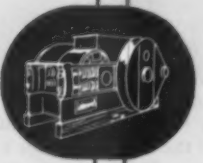
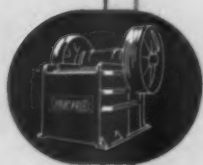
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## SLAG PRODUCTS

(Continued from page 148)

method, however, is removal by a dragline excavator. The speed of clearing is only a question of the width of the bed and the weight of the dragline bucket which, owing to the light weight of the foamed slag, should be of large capacity.

This bed foaming process was first developed in England and has been

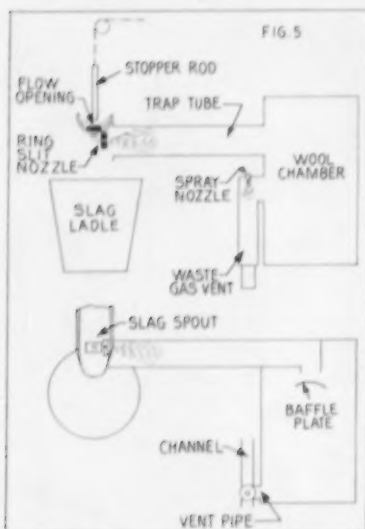


Fig. 5: Diagram showing layout of operating equipment

adopted for use on the European Continent, where some further important developments in the process have taken place. The German Huettnerwerk Rheinhausen concern is using this process and has made important modifications. This company uses the Thomas process of steel manufacture and the slag produced is a highly viscous material which had been found impossible to foam successfully by any of the mechanical processes. It was found that the slag could be foamed quite successfully with the bed foaming system.

Difficulty was first encountered because the German ladles were designed only for slow tilting by hand. They are not designed for rapid tilting. To overcome this, a device was developed which was termed the "tilting bucket." It is shown in D 10 in Fig. 1. The molten slag can be emptied slowly from the ladle into this tilting bucket free of skulls or tramp iron. As soon as it is filled, this tilting bucket is jerked on to the bed mechanically with one quick movement.

The next development at the Rheinhausen works was to try to make a single foaming bed achieve the work of two or three stationary beds. The

idea was that instead of clearing each bed with a dragline or other means, the bed would be designed in metal and it would be made tiltable so that as soon as the slag on the bed solidified—which is a matter of minutes—the whole bed could be tilted and the whole mass of foam covering the bed would slide off the bed in one operation. This was to enable the bed to be ready immediately for the next operation. The design of this new modified bed is shown in D 11 and D 12 in Fig. 1. This tilting bed has been producing expanded slag for over three years in large quantities from an "unfoamable molten slag."

### Super Lightweight Foamed Slag

Use of the plaster aggregates for super-lightweight concrete mixes raised the question as to whether it would be possible to produce a similar expanded slag product on the foaming bed, which would provide a high degree of insulation at a relatively low price, similar to existing relatively expensive plaster aggregates. The problem was to produce a particularly light type of non-structural foamed slag with properties near or identical to those of the "plaster aggregates." After a great deal of thought, trial and error, a method was discovered for the mass-production of such a product on the slag foaming bed.

The method has given positive results with foundry iron slags, but it is believed that the method will also be applicable to other types of slag. The cost of such a material will be well below that of the present plaster aggregates. The first, full-scale plant for producing this product is now being built. The test results of this product relating to bulk density, are shown in Fig. 2. The test figures show a weight varying between 11 and 12 lb. per

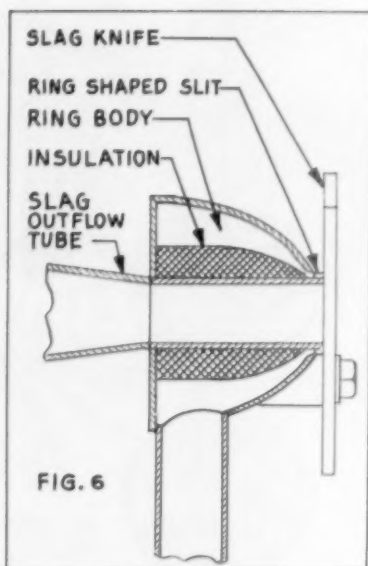


Fig. 6: Blowing nozzle for production of slag wool

cu. ft. for 1/2-in. (No. 7) sieve, and a weight of 29.9 lb. per cu. ft. for the grading passing the 100 mesh sieve. It was this latter figure and the appearance of the material under a magnifying glass which convinced the workers they were dealing with a new material which, while chemically to all intents and purposes is identical with the normal foamed slag, has entirely different physical properties.

### Results with Feather Weight Foamed Slag

It was found in the test mix results\* that the weights of the new aggregate produced on the pilot bed of this new feather weight foamed slag were somewhat higher than those published for

(Continued on page 159)

NOTE: YIELD FIGURES CALCULATED FROM WEIGHT PER CU. FT. OR KG./M <sup>3</sup>		COMPARATIVE TABLE I AGGREGATES										NOTE: ST. INDICATES SHORT TONS 2000 LB. LT. INDICATES LONG TONS 2240 LB. MT. INDICATES METRIC TONS 1000 KG.	
TYPE OF AGGREGATE	WEIGHT (RODDED) LB. CU. FT. OR (KG./M <sup>3</sup> )			YIELD CU. YD./TON OR (M <sup>3</sup> /MT)			ABSORPTION % PER WEIGHT		CRUSHING STRENGTH AGGREGATE LB./SQ. IN. OR (N/CM <sup>2</sup> )	THERMAL CONDUCTIVITY K. IN. 8 IN. OR (W./CM. SQ. CM.)	PRICE		
	COARSE	FINE	MIXED	COARSE	FINE	MIXED	COARSE	FINE					
U.S. EXPANDED SLAG	31.0 (4.97)	59.0 (34.5)		2.2 (5.1)	1.3 (5.1)	1.7 (5.1)	21.3	5.2	360 (25.3)	1200 (84.5)	NOT PUBLISHED		
	48.0 (7.69)	61.0 (3.77)		15.5 (1.2)	12 (5.1)	13 (5.1)	22.6	8.0	240 (6.9)	1040 (73.1)	NOT PUBLISHED	DOLLARS	USA
			67.0 (3.73)			11 (5.1)	MIXED	3.3	395 (27.8)	1300 (91.3)	NOT PUBLISHED		
BRITISH STANDARD FOAMED SLAG	30-36 (8.90-5.77)	40-45 (8.41-7.21)		26-23 (1.0-1.1)	20-18 (1.0-1.1)		NOT AVAILABLE			COARSE 0.68-0.9 (0.084-0.112) FINE 0.84 (0.104)	1-1.0-0.8 PER LONG TON	BRITISH STANDARD	
PERLITE		9.4 (1.5)		78 (5.1)	86 (3.9)		15.3	2.2	30 (2.1)	91 (6.4)	0.22-0.35 (0.027-0.043) PRODUCER'S FIGURES	DOLLARS PER TON	PERLITE
VERMICULITE		10.0 (1.6)		70 (5.1)	57 (3.9)		12.8	0.5	11 (0.78)	38 (2.6)	0.4-0.5 (0.049-0.062) PRODUCER'S FIGURES	DOLLARS PER TON	VERMICULITE
NEW MATERIAL	10.8 (1.7)	16.0 (2.6)	17.5 (2.8)	APPROX. 4.6 (0.7)	APPROX. 4.6 (0.7)	APPROX. 4.6 (0.7)	85.5-92.0		NO TESTS AVAILABLE	0.55 BTU FOR ALL IN GRADE AT 225 LB./CU. FT. (0.068 KG./M <sup>3</sup> ) AT 360 KG./M <sup>3</sup> 0.50 BTU FOR 75-NO. 7 GRADE AT 14 LB./CU. FT. (0.062 KG./M <sup>3</sup> ) AT 224 KG./M <sup>3</sup>	NOT YET MARKETED	NEW MATERIAL	

BEHIND  QUALITY



The New York City Water Supply Co. uses these 2 yd. Lima Type 802's (above and at left below) to quarry rock near Neversink, N. Y. Lima quality really pays off in low downtime on tough digging jobs like this.

## These LIMAS dig and load rock fast... and stay on the job day-in and day-out

It takes a really rugged machine to dig and load rock day-in and day-out. That's why thousands of users depend on Limas—like the Type 802, 2 yd. shovel shown here—to handle their toughest rock jobs. They know that Lima quality guarantees them the extra-rugged construction needed for high output, low downtime, money-making operation.

It will pay you to get the full story on the complete line of quality-built Limas. Find out today how you can get maximum performance and operating economy—with a Lima. See your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

**COMPARE QUALITY!** No other machine gives you as much as LIMA!

1. Piston-type dirt seal rings and retainers in crawler rollers.

2. Moving parts are flame or induction hardened for longer life.

3. Main machinery is placed well back of center of rotation.

4. Anti-friction bearings at all important bearing points.

5. Big capacity drums and sheaves are easy on cables.

6. Torque converter (optional).

7. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (1/2 yd. to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.



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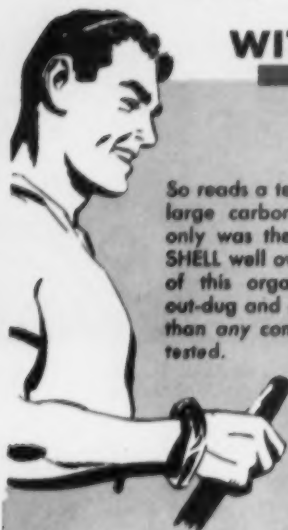
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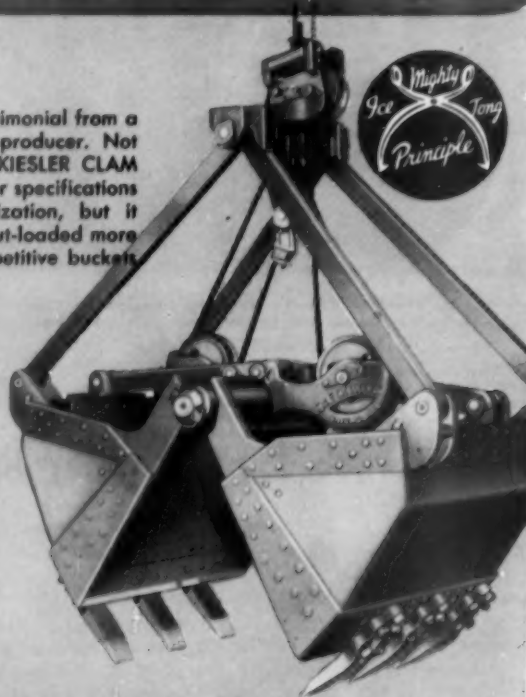
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Factory service on Kiesler Buckets and as an accommodation on other makes, too. Whatever the problem, feel free to call on us.

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Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

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Since 1892

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## LABOR RELATIONS

(Continued from page 27)

respect to interstate commerce, exaction of valuable considerations by force, violence or coercion, 'not including, however, the payment of wages by a bona-fide employer to a bona-fide employe.' We held in Local 807 that this exception covered members of a city truck drivers' union offering superfluous services to drive arriving trucks to their city destination with intent, if the truck owners refused their offer, to exact the wages by violence.<sup>5</sup> In the Hobbs Act, 60 Stat. 420, carried forward as 18 U. S. C. §1951, which amended the Anti-Racketeering Act, the exclusion clause involved in the Local 807 decision was dropped. The legislative history makes clear that the new Act was meant to eliminate any grounds for future judicial conclusions that Congress did not intend to cover the employer-employee relationship.<sup>6</sup> The words were defined to avoid any misunderstanding.

'Title II of the Hobbs Act provides that the provisions of the Act shall not affect the Clayton Act, § 56 and 20, 38 Stat. 731, 738; the Norris-LaGuardia Act, 47 Stat. 70; the Railway Labor Act, 47 Stat. 576; or the National Labor Relations Act, 49 Stat. 449.<sup>7</sup> There is nothing in any of those Acts, however, that indicates any protection for unions or their officials in attempts to get personal property through threats of force or violence. Those are not legitimate means for improving labor conditions.<sup>8</sup> If the trial court intended by its references to the Norris-LaGuardia and Wagner Acts to indicate any such labor exception, which we doubt, it was in error.

(Continued on page 166)

<sup>5</sup>The exception was held also to permeate the entire Act. P. 527, n. 2.

<sup>6</sup>Beginning soon after our decision in the Local 807 case, a series of bills were introduced in Congress looking toward an amendment to the Anti-Racketeering Act of 1934. S. 2347, 77th Cong., 2d Sess.; H.R. 6872, 77th Cong., 2d Sess.; H.R. 7067, 77th Cong., 2d Sess.; H.R. 653, 78th Cong., 1st Sess.; H.R. 32, 79th Cong., 1st Sess. The last of these bills, H.R. 32, supra, was enacted and became the Hobbs Act, 62 Stat. 793. The House Committee on the Judiciary, in its report on H.R. 32, stated:

'It is not the intention of the committee that title III [enacted as title II] be interpreted as authorizing any unlawful acts, particularly those amounting to robbery or extortion. The need for the legislation was emphasized by the opinion of the Supreme Court in the case of United States v. Local 807 (315 U.S. 521).<sup>7</sup> H.R. Rep. No. 238, 79th Cong., 1st Sess., p. 10. See also S. Rep. No. 1516, 79th Cong., 2d Sess. Each of the prior bills had the same purpose—amending the Anti-Racketeering Act so as to change the terms which brought about the result reached in the Local 807 case. See H.R. Rep. No. 2176, 77th Cong., 2d Sess.; H.R. Rep. No. 66, 78th Cong., 1st Sess. And see 91 Cong. Rec. 11842, 11848, 11909, 11911, 11919, 11920.

<sup>7</sup>The Hobbs Act was enacted prior to the Labor Management Relations Act of 1947.

<sup>8</sup>Cf. United States v. Ryan, No. 31, this Term; United Construction Works v. Laburnum Corp., 347 U. S. 656; Allen-Bradley Local v. Wisconsin Board, 315 U. S. 740; Labor Board v. Fansteel Corp., 306 U. S. 240; United States v. Kemble, 198 F. 2d 889.

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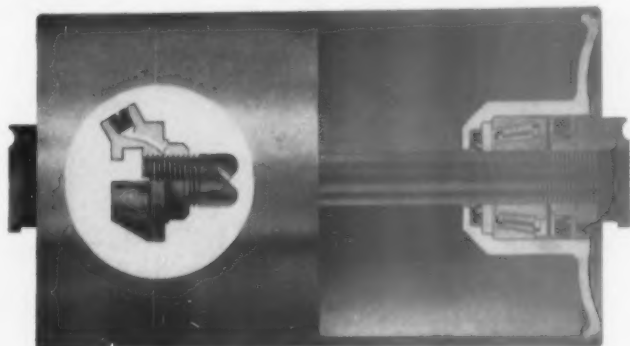
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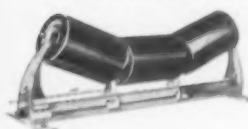
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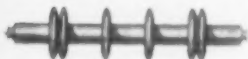
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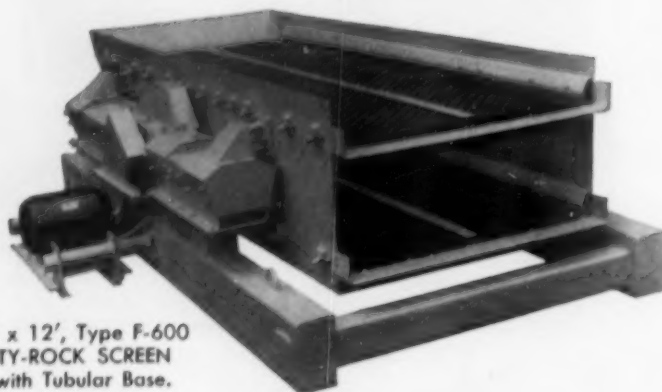
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TY-ROCK SCREEN  
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There is a Tyler Vibrating Screen for every sizing and dewatering job. Tyler Screens are noted for the huge tonnages handled with top efficiency and low cost per ton.

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Manufacturers of Woven Wire Screens and Screening Machinery

## DID YOU BENEFIT FROM SOMETHING YOU READ IN "ROCK PRODUCTS"

Elsewhere in this issue is a special card to make it easy to subscribe for a friend or employee. Why not pass along the card to people you think should be reading ROCK PRODUCTS every month.

### Sales Manager

HASCALL B. DUBOIS has been appointed sales manager of the Golding-Keene Co., Buffalo, N.Y., producers of feldspar and mica at Keene, N.H., and Trenton and Camden, N.J., in addition to managing export sales for the parent corporation, Spar-Mica Corp. Ltd., Montreal, Canada. From 1930 to 1937, Mr. DuBois was representative in East Liverpool, Ohio, of Consolidated Feldspar, now a subsidiary of International Minerals and Chemical Corp., Chicago, Ill. He moved to Erwin, Tenn., as vice-president and sales manager of Consolidated until it was purchased by International and subsequently became sales manager and then assistant manager. A graduate of New York State College of Ceramics, Mr. DuBois received a professional degree in ceramic engineering from Alfred University, Alfred, N.Y.

### Consulting Engineer

VICTOR KJELLMAN, formerly a consulting field engineer for the Portland Cement Association in the New England area, has been appointed consulting engineer and sales manager of Duracrete Block Co., Inc., Manchester, N. H. A registered professional engineer in Massachusetts, Mr. Kjellman is a member of the American Concrete Institute, Boston Society of Engineers, and is currently chairman of the membership committee of the New Hampshire division of the American Society of Civil Engineers.

### K.C.S.A. Officers

EMIL BERRY, owner of the Jefferson County Stone Co., Anchorage, Ky., was recently elected president of the Kentucky Crushed Stone Association. He succeeds J. Robert Thompson, president, Blanton Stone Co., Inc., Frankfort, who was named a director. Other officers are Sam Nally, Nally & Boone, Bardstown, vice-president; Marton King, Canton, secretary, and Miss Margaret Smith, Lexington, treasurer.

### Heads Memphis Stone Firm

CHARLES D. SMITH II has been appointed president of the Memphis Stone and Gravel Co., Memphis, Tenn., in addition to his duties as treasurer. He succeeds Jesse S. Cooper, president since 1948, who has been named chairman of the board and general manager. Louis C. Ring remains as executive vice-president and secretary of the firm. Thomas Salmon, Houston, Miss., and George S. Gee, Jackson, Tenn., have been appointed vice-presidents.

# How to take the "Measure" of a nose-ring casting

Longer nose brick life, and longer continuous service, are big factors in evaluating a B&W nose-ring casting. In many cement, lime and dolomite plants, casting life has exceeded 9 years due to the following features.

## WITH B&W NOSE-RING CASTINGS:

- End of kiln shell is protected from the direct flame, and does not "feather down" from oxidation.
- Installation cost is low; B&W Castings are small and light in weight.
- Belling out of kiln shell is eliminated, resulting in longer brick life and longer continuous operation.
- Protecting flange on casting permits use of low-alloy steel bolts.
- Allowance is made for thermal expansion, removing one cause of belling.
- Four castings are used per foot of kiln diameter. Spare parts inventory may be kept low, as the same casting may be used on kilns varying up to two feet in diameter.

Take advantage of these benefits in your plant. For further details on low-cost kiln maintenance with B&W Nose-Ring Castings, write to The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.

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& WILCOX**

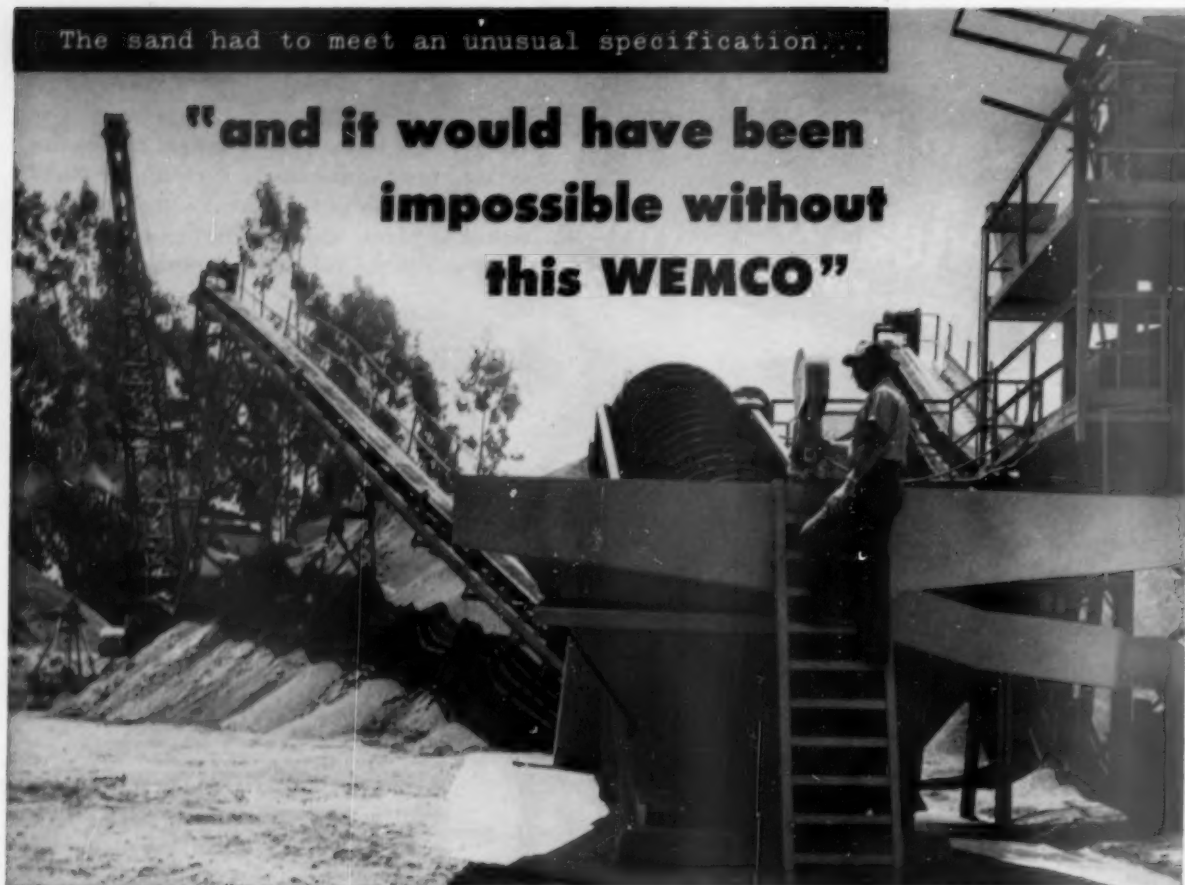


BOILER  
DIVISION

S-443

The sand had to meet an unusual specification.

**"and it would have been  
impossible without  
this WEMCO"**



When the Niles Sand and Gravel Company got the sand and aggregate order for the Ford Motor Company's new assembly plant in Milpitas, California, it was on the basis of an exceptionally rigid sand requirement. It has now been successfully fulfilled, and H. G. Clouser, Niles plant superintendent, reports, "this would not have been possible except for the adaptability of our 60-inch Wemco Sand Preparation Machine".

With 60,000 yards of concrete being poured on this one Ford plant, the fineness modulus was not permitted to vary more than 0.2%. Plus 200 mesh fines had to be retained in correct proportion and - 200 mesh had to be eliminated as completely as possible. A continuous materials testing program was under the direction of Hales Laboratories of Oakland.

After his experience on these very exacting requirements, Mr. Clouser of Niles Sand and Gravel Company states, "I believe that the Wemco Sand Preparation Machine, intelligently used, can meet practically any desired sand specification." "It has proven particularly adaptable to various operational changes we have made." "The hydraulic screw lift makes it readily adjustable to day-to-day pit variations." "And it has been one of the most troublefree pieces of equipment in our plant (three years running on its original wear shoes)."

*For descriptive literature, write Dept. J-2442.*



Plant operator Tom Brannon using the hydraulic spiral lift. This simple adjustment compensates day-to-day pit variations, and in locations where freezing is a problem may also be used to break surface ice (eliminating the need for draining the tank for overnight shutdown).

**WEMCO**  
WESTERN MACHINERY COMPANY

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Representatives in principal cities of the United States and Canada  
and in major countries throughout the world.

## SLAG PRODUCTS

(Continued from page 152)

plaster aggregates. This higher weight material had a stronger texture and also reduced friability, a further advantage. It was found that it is not what the aggregate weighs before mixing, but what the final product will weigh that counts; in short, how it will withstand breaking up and thus shrink in volume in the mixer.

It was found that although the weight of the plaster aggregates was lower than the feather weight foamed slag, the weight of the final product made from this "feather weight foamed slag" was nevertheless about the same and in some instances, even less. The logical consequence of practically the same weight was that the insulating properties of the product also turned out to be identical.

The figures given in Tables 1 and 2 show that this new type of foam is something entirely new and different than what has been known up to now as "foamed or expanded" slag. Two comparative schedules are compiled, one for aggregate and one for concrete. The materials compared are the U. S. expanded slag, the British standard foamed slag, perlite, vermiculite and the new feather weight foamed slag.

COMPARATIVE TABLE 2 CONCRETE					
TYPE OF AGGREGATE	WEIGHT OF CONCRETE PER CU. FT. OR KG/M <sup>3</sup>	ABSORPTION % BY DRY WEIGHT	COMPRESSIVE STRENGTH LB./SQ. IN. OR KG/CM <sup>2</sup> 28 DAYS	THERMAL CONDUCTIVITY K BTU OR K CAL/CM <sup>2</sup>	SHRINKAGE %
U.S.A. EXPANDED SLAG MARK 5.6	67-92 (873-1473)	18.9-11.3	575-2980 (40.5-209.5)	1.55-2.40 (0.192-0.298)	0.071-0.104
U.S.A. EXPANDED SLAG MARK 5.7	PRACTICALLY IDENTICAL 84-108 (1345-1730)	12.7-10.8	425-4300 (29.8-302.5)	1.90-3.16 (0.236-0.392)	0.104-0.104
U.S.A. EXPANDED SLAG MARK 5.8	90-119 (1442-1908)	20.0-13.8	370-3565 (26.0-250.5)	2.01-3.16 (0.249-0.392)	0.167-0.125
BRITISH STANDARD FOAMED SLAG 1 8 16 1 4 8 1 2 4 1 1 2	69 (1106) 79 (1267) 98 (1570) 116 (1858)	NO TESTS AVAILABLE	184 (12.9) 445 (31.2) 2267 (159.5) 5220 (367)	APPROX 1.7 (0.211) APPROX 2.2 (0.273) APPROX 3.0 (0.372) APPROX 3.7 (0.459)	ALL WITHIN BRITISH STANDARD SPECIFICATIONS 492 & 834
PERLITE	24-53 -845	34.5-26.4	95-1120 (6.6-78.7)	0.75-1.45 (0.095-0.180)	0.196-0.192
VERMICULITE	28-49 (448-785)	117.9-35.9	125-385 (8.7-41.2)	0.97-1.60 (0.123-0.198)	0.346-0.471
NEW MATERIAL	35.8-60.5 (573-969)	NO TESTS AVAILABLE	36-245 (2.53-17.22)	0.855-1.185 (0.106-0.147)	0.064-0.124

The main conclusions to be derived from the comparisons are as follows:

### TABLE 1 — AGGREGATES:

(1) All physical properties of the new feather-weight material differ from those of normal expanded slag or foamed slag.

(2) The weight of the feather-weight slag is slightly higher than that

of vermiculite or perlite but the thermal conductivity (K value) appears—weight for weight—to be better.

(3) The absorption of the feather-weight slag is higher than expanded or standard foamed slag, but is considerably lower than that of the plaster aggregates.

(4) Production costs and price are

(Continued on page 160)



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\* as a preliminary pulverizer  
for compartment or tube mills.

**The quickest, most economical way  
to increase your grinding capacity**

For the cement manufacturer with excess kiln capacity . . . here is the answer to INCREASED CAPACITIES at an appreciable SAVING IN HORSEPOWER. The Bradley Hercules Mill, used as a preliminary pulverizer, before compartment mills or tube mills, results in INCREASED PRODUCTION of finished material at a LOWER COST per barrel.

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Automatic electrical feed control eliminates manual operation.

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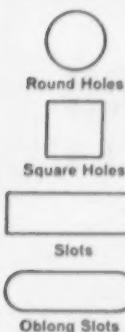
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Does your screen last as long as you expect it to?	<input type="checkbox"/>	<input type="checkbox"/>
Is it easily replaced with a minimum of down time?	<input type="checkbox"/>	<input type="checkbox"/>
Are the openings in the screen the exact size you want?	<input type="checkbox"/>	<input type="checkbox"/>
Are the openings of uniform size, shape and spacing?	<input type="checkbox"/>	<input type="checkbox"/>
Is the temper of the metal proper for your requirements?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have a minimum of blinding in the screens?	<input type="checkbox"/>	<input type="checkbox"/>
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If you can't answer "yes" to every question, you are losing efficiency and should try

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considerably below those shown for plaster aggregates.

TABLE 2 — CONCRETE:

(1) The weight of concrete is slightly heavier and the crushing strength a little lower. However, the aim is the 40 lb. per cu. ft. range only where strength requirements are secondary. For higher strength, the feather-weight material would not be used. Standard foamed slag, which costs less, requires less cement and will show less shrinkage, would be employed.

(2) Featherweight foamed slag concrete is not behind vermiculite and perlite in regard to thermal conductivity and in shrinkage figures the new lightweight concrete is the lowest.

\*Details regarding the development of the foaming bed system of expanded slag production and the developments and properties of the new feather-weight expanded slag material have been abstracted from the paper read by M. Gallai-Hatchard before the International Slag Conference held in Brussels, Belgium, October, 1954.

## LABOR RELATIONS

(Continued from page 154)

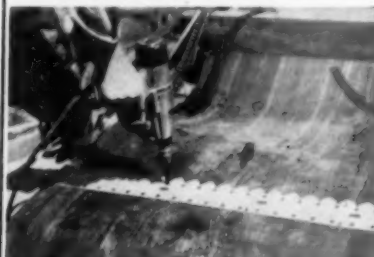
Apparently what the Court meant is more clearly expressed by its statement, set out in the last paragraph of note 2 above, that the charged acts would be criminal only if they were used to obtain property for the personal benefit of the union or its agent, in this case Green. This latter holding is also erroneous. The city truckers in the Local 807 case similarly were trying by force to get jobs and pay from the out-of-state truckers by threats and violence. The Hobbs Act was meant to stop just such conduct. And extortion as defined in the statute in no way depends upon having a direct benefit conferred on the person who obtains the property.

"It is also stated in the opinion below that to interpret the Act as covering the activity charged would 'extend the jurisdiction of the Court and the power of Congress beyond their Constitutional limits.' 135 F. Supp., at 162. The same language is in the order. Since in our view the legislation is directed at the protection of interstate commerce against injury from extortion, the court's holding is clearly wrong. We said in the Local 807 case that racketeering affecting interstate commerce was within federal legislative control. 315 U. S., at 536. Cf. *Cleveland v. United States*, 329 U. S. 14, 19; *Mitchell v. Vollmer & Co.*, 349 U. S. 427.

"On this appeal the record does not contain the evidence upon which the court acted. The indictment charges interference with commerce by extortion in the words of the Act's definition of that crime. We rule only on

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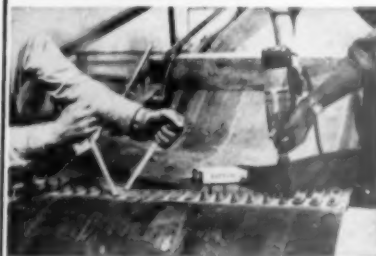
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**THESE WHITES  
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Just like every White Truck that goes into service, these rugged and husky Whites are built for extra earning power—engineered right to the job. They are part of a huge fleet of Whites in the Massachusetts construction industry doing a great job with top payloads—low operating cost and longer truck life.

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"TREES ARE A CROP"



**HAMMOND BAG  
& PAPER COMPANY, INC.**

Division of Hudson Pulp & Paper Corp.  
General Offices: Wellsburg, W. Va.

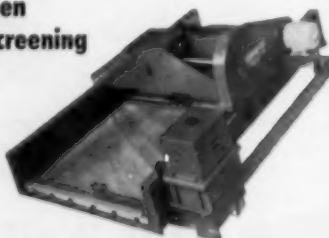
### The Leahy Heated Screen Cuts Cost of Difficult, Damp Screening

The toughest screening problem you have is solved most economically with the proved Leahy Heated Screen.

Differential Vibration snaps wedging particles loose while FlexElex heating stops build-up of damp fines so expensive blinding can't start. The result is maximum tonnage of accurately sized products on long, non-stop schedules.

Send for Bulletin 16-EH.

**The DEISTER CONCENTRATOR COMPANY**  
915 Glasgow Avenue, Fort Wayne, Indiana



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Incorporated 1906

the allegations of the indictment and hold that the acts charged against appellees fail within the terms of the Act. The order in arrest of judgment is reversed and the cause remanded to the district Court.

"It is so ordered."

### Dissenting Opinion

Mr. Justice Douglas, with whom The Chief Justice and Mr. Justice Black concur, dissenting.

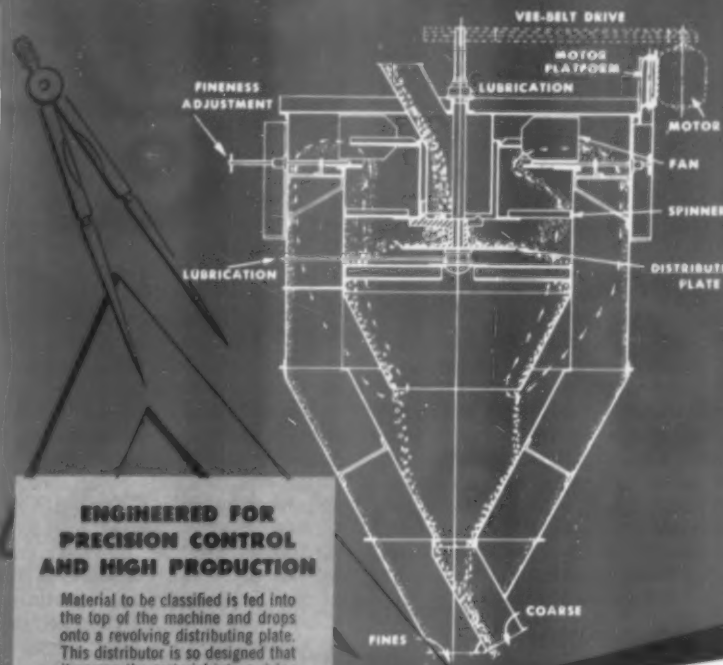
"The Government has no right to a direct appeal to this Court under 18 U. S. C. § 3731 if the District Court judgment 'was not placed solely upon the invalidity or construction of the statute.' *United States v. Wayne Pump Co.*, 317 U. S. 200, 208. (Italics added.) The presence of any additional and independent ground for the District Court's order is fatal to direct review here. I am convinced that there is such an independent ground for the District Court's judgment in this case. It is evident from the district judge's memorandum opinion (135 F. Supp. 162) that his order granting the motions in arrest or judgment rested at least in part upon the insufficiency of the evidence to support the conviction. He considered facts not alleged in the indictment, e.g., that contractors in the community had customarily agreed to the employment of labor which allegedly was demanded by appellees, and that the trouble on the particular job was caused by a disagreement between the contractor and labor, not by an attempt to extort. I would therefore dismiss the Government's appeal.

### Belgian Cement Sales Grow

BELGIUM'S CEMENT COMPANIES are anticipating increases in future sales of cement to its domestic market, as well as in exports which are its chief markets. Ciments deObourg is installing an additional cement kiln which is expected to boost production by at least 500,000 tons annually, and other companies are planning expansion of productive capacities, including Ciments Bataille and CBR.

Sales to America during 1955 were reported greatly increased as the United States industry was unable to meet the demand. In addition, sales to Switzerland are expected to become of greater importance in the future. The Netherlands, Belgium's chief customer for cement, continues to be of major importance.

In 1955, cement production in Belgium hit a record level of 4,689,000 tons, partly boosted by a record December output of 373,000 tons. Although its domestic demand continued at record levels of about 2,750,000 tons during 1955, Belgian expects its chief market to remain in exports.



**More Accurate  
Sizing Of Ground  
And Pulverized  
Materials!**

**ENGINEERED FOR  
PRECISION CONTROL  
AND HIGH PRODUCTION**

Material to be classified is fed into the top of the machine and drops onto a revolving distributing plate. This distributor is so designed that it sprays the material into a rising air current which entirely surrounds the plate. The finer particles are lifted by the air stream and the coarse particles drop down to the reject spout. Passing up through the separating chamber, the dust-laden air is given a whirling motion between Spinner blades and any remaining oversize particles are precipitated. The separator is adjustable to control the fineness of the finished product with unusual accuracy.



18-Foot Williams RC Separator being tested at plant before shipment.

**WILLIAMS  
MECHANICAL AIR SEPARATORS  
For Finenesses From 30 to 325 Mesh**

- Most efficient mechanical air separator ever developed for classifying ground and pulverized materials, or for removing fines from dry ground materials before classifying.
- Product quality is vastly improved and output considerably increased when operated in closed circuit with virtually any type of mill.
- Will handle with equal efficiency a complete range of products—mineral, chemical and vegetable—from the hardest, most dense limestone and ore to the softest, fluffiest starches and flours.
- Permits coarser settings in grinding equipment thus lengthening equipment life by reducing wear on all moving parts. Power consumption is much lower.
- Extra heavy construction. Equipped with anti-friction bearings encased in dust-proof and moisture-proof housings. All casings are of heavy steel plate construction. Operation is dustless and repair cost is practically nil, since there are no fine sieves to wear out and the heavy construction insures long life.

9 Standard sizes, 2½ to 18-foot diameters — Capacities from 500 lbs. to 75 tons hourly

*Write For Details And Describe Your Operation*

**WILLIAMS PATENT CRUSHER & PULVERIZER CO.**  
800 ST. LOUIS AVE. • ST. LOUIS 6, MO.

**WILLIAMS**



**CRUSHERS**

**GRINDERS**

**SHREDDERS**

**OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD**

# Processing Anhydrite For Cement and Sulphuric Acid

By LEO WALTER

A NEW ANHYDRITE MINE in England has been opened at Sandwith, England, near Whitehaven, on the west coast in Cumberland, on what are claimed to be the richest and most extensive beds of anhydrite in Britain.

Due to an apparent dwindling of sulphur resources and heavy demands in the United States, the federal government in 1951 seriously restricted exports. Since the United Kingdom was dependent upon American elemental sulphur for half of its sulphuric acid production, the British Government initiated an investment program to make greater use of indigenous raw materials such as anhydrite in sulphuric acid manufacture. Marchon Products Limited, chemical manufacturers, located deposits of anhydrite in the vicinity of its Whitehaven factory and decided to build a sulphuric acid and cement plant, using the mined anhydrite as the raw material. To do this, a new company, Solway Chemicals Limited, was formed.

The mine has been designed to produce 7000 tons of anhydrite every five-day week at 8 hr. a day. When the new plant is in full operation at the end of the year, it is estimated that at least 90,000 tons of sulphuric acid, and a similar quantity of cement, will be manufactured annually. Deposits at Whitehaven are so vast that supplies are expected to last for several hundred years.

Inside the mine, the room and pillar method of extraction is used, only 60 percent of the mineral being taken, the remaining 40 percent being left as pillars to ensure that there shall be no disturbance of the surface above the workings. The face is drilled in a fixed pattern by electric rotary drills supported on a specially designed crawler tread carriage, and the holes are charged with explosive and fired by milli-second delay detonators. Each blast produces about 100 tons of anhydrite, which is loaded out by crawler-tread mounted electric Eimco shovels into a new type of Muir-Hill diesel-driven dumper. The dumpers tip the anhydrite into hoppers formed in the rock underground, and feeders carry the anhydrite from the hoppers on to the belt conveyor, which discharges directly into the screening and crush-

ing system on the surface. The mine is already producing about 4000 tons a week.

Power supplies to the electrical equipment of the mine have made necessary the installation of nearly 5000 yards of 660-volt and 3300-volt cable to supply the conveyor heads and transformers, and 3600 lin. ft. of 660-volt cable for supply and lighting in the brake house which controls the movement of railway cars to and from the mine. The electric rotary drills are supplied with current via 3150 lin. ft. of 91/.018 in. trailing cable.

## LIME CONVENTION

(Continued from page 146)

tensive research study concerning the fundamental nature of lime and limestone in order to find answers to many unsolved problems. The following two tables outline the scope of this program. Professor Voss admitted the program would take a long time to complete, or may never be completed; yet the research should lead to ways of improving processing, of evaluating natural resources, and of expanding the uses for lime.

Ellis K. Phelps, Komline-Sanderson Co., Peapack, N. J., discussed "Lime on Upgrade with Vacuum Filtration of Sewage Sludges." In sludge treatment, he said, the problem is to get rid of the water. Lime plays a big role by making free water more readily extracted. The growing use of vacuum filters like the coil spring type made by Komline-Sanderson points to an ever growing market for lime in sludge treatment. To illustrate the role of lime in this process, Mr. Phelps showed a company movie entitled "The Coil-filter Story," which described the entire operation of a trickling filter sewage purification plant in St. Charles, Ill. Lime serves to condition the sludge prior to dewatering by the vacuum filter; it also helps eliminate odor and flies.

The role of high calcium lime and dolomitic lime in water treatment was discussed by Dr. A. P. Black, water plant consultant and Head, Department of Chemistry, University of Florida. At the outset, he predicted a great future for lime, in view of this chemical being one of the cheapest, most

effective bases available. High calcium lime is used as a water softener, an accessory coagulant, and in stabilization of treated water. In its major use — water softening — lime removes free  $\text{CO}_2$ , calcium and magnesium bicarbonates. He reported that about 200 water softening plants have been built in Florida alone in recent years. Dolomitic lime is used primarily to aid in removing organic color from hard water and in reducing silica in boiler water. More recently, he said, a few plants have used dolomitic lime to remove excess fluorides from the water. This use will undoubtedly grow, since there are more than 600 plants treating water containing excess fluorides.

Another significant recent development in water softening is the use of powdered quicklime rather than hydrated lime, the lime being added to the process without slaking. Because the lime must dissolve before reaction can occur, the lime must be finely ground. Since the quicklime is best supplied in bags, this use is particularly applicable to smaller plants. Savings of about \$3 per million gallons of water treated (or about \$5000 per year for some plants) have already been effected through use of the lower-cost quicklime.

Commenting on the future of lime in water softening, Dr. Black cited recent competitive developments which may adversely affect the lime market. Further development of zeolite-type home water softeners and wash powders which will work as well in hard water as soft water may make it somewhat difficult to justify the need for water softening plants, he said. Sludge recalcination is also offering competition, although it is only practical in the larger water softening plants. Dr. Black believes that recalcination should not be justified on the basis of profit alone, but rather if it also helps to solve a health problem or waste disposal problem.

In a talk on "Foreign Lime Developments," B. J. Gee, director, Settle Limes Ltd., Yorkshire, England, stated that annual lime output in England amounts to  $3\frac{1}{2}$  million tons; crushed limestone, 20,000,000 tons; and chalk, 20,000,000 tons. Due to wide distribution of limestones, the lime industry is widespread, he said, with each plant serving markets generally within a 50-mile radius. Most of the larger plants are mechanized, in contrast to the smaller antiquated plants. Due to the high cost of plant and equipment, the smaller plants are fighting a losing battle and are on the decline, he added. (A 150 t.p.h. quarry operation in England would involve a capital outlay of \$400,000). Beneficiation or washing

(Continued on page 166)



Handy Tournatractor services 3 shovels over widely scattered work area in 6000' x 4000' limestone pit. It pushes in shallow toe ahead of shovel for faster loading. It's fast enough to follow the dipper in and out to clean-up truck and dipper spillage.

## 2 rubber-tired tractors

- ... clean-up around shovels
- ... doze rock between shovel swings
- ... service 10 to 12 crushed-stone stockpiles
- ... make 2-mile swing cycle

At Material Service Corporation's Thornton, Illinois quarry—the largest commercial quarry in the world—over 3,000,000 tons of limestone are removed yearly. To speed shovel clean-up, dozing, and other jobs at this huge 6000' x 4000' pit, Material Service Corp. uses 2 fast, 17 mph, rubber-tired, 208 hp Tournatractors.

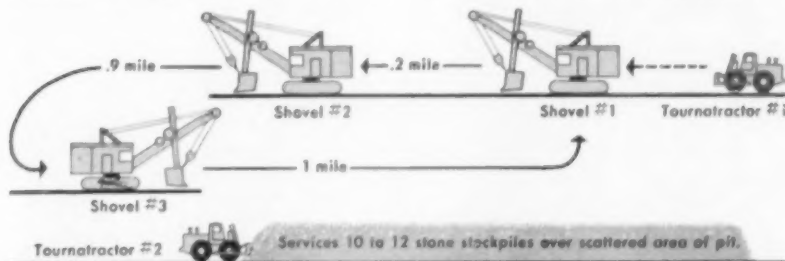
### Make 2-mile swing cycle

A major advantage of the rubber-tired Tournatractor on this assignment is its ability to travel fast at speeds to 17 mph, from shovel to shovel . . . scattered .2, .9 and 1 mile apart . . . making a swing cycle for clean-up

service of over 2 miles. Instant-shift, constant-mesh transmission enables this big rubber-tired dozer to move in fast and back away in a hurry, without delaying the shovel cycle. Between shovel swings, the versatile tractor dozes in scattered rock to keep material in good shovel-loading position . . . also pushes back toe of blasted material from bank ahead.

### Tires eliminate abrasive wear on multiple track parts

Big, low-pressure rubber tires with heavy ground-gripping action make Tournatractor safe and sure-footed. Tires roll over abrasive materials . . .



do not grind in them. They cushion the ride for the operator, and reduce maintenance to a minimum, because 4 wheels do the work of some 500 wearing parts in a crawler-tractor's track mechanism.

Power from the Tournatractor's 208 hp diesel moves on high-speed, anti-friction bearings sealed in oil. With this all-gear drive you have no chains or tracks to stretch, snag, or wear. Power goes direct from transmission to drive wheels. As a result, there are less friction losses and wear due to hundreds of open parts grinding in dirt or abrasives.

Before you buy a tractor for your clean-up, dozing, servicing, maintenance, or other jobs, investigate the high speeds, lower maintenance, and greater mobility that Tournatractor can give you. It frequently replaces 2 or 3 crawlers in one pit!



Fast 17 mph speeds enable Tournatractor to travel anywhere in the pit, dumps, stockpile area, or plant, with only a few minutes moving delay between assignments. One man, one machine, can make two or three cycles, to cover all clean-up assignments per shift. Often, several near-by pits are serviced by one of Material Service's Tournatractors.



Tournatractor maintains and services 10 to 12 crushed stone stockpiles located over a widely scattered area of the quarry. Equipped with 11' 4" wide, 3' 7" high bulldozer blade, Tournatractor dozes bladeful of abrasives. Tournatractor — Trademark Reg. U.S. Pat. Off. T-940-Q-b



**LeTourneau-WESTINGHOUSE Company**

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

of limestone is seldom required due to abundance of high quality deposits.

Vertical mixed feed-type kilns predominate, he said, although he suggested there is need for development of a moderate-sized rotary kiln (50-60 t.p.d.) capacity which could handle 3-in. or 2-in. stone at a fuel consumption of 600,000 B.t.u.'s. At present, there is an oversupply of these stone sizes which are too small for shaft kiln feed. He indicated that a large rotary kiln plant (120-150 t.p.d. capacity) would cost about \$600,000.

In discussing burning, Mr. Gee reported fuel costs to be excessive, amounting to about half of the total cost of producing lime (coal costs average \$3 per ton of lime produced, and lime sells at only \$7.50 per ton). Coke is also used, but is even more expensive. Oil is becoming a possibility for lime burning in England, and theoretical data places the cost less than coke and only slightly more than coal (25¢ per ton of lime more). Oil is already being used in Sweden, Norway, and Italy, he said. One objection to oil will be the problem of high-sulphur pick-up, which would rule out the steel market (the sulphur specification is 0.2 percent). Natural gas is not used, although the Settle company in 1954 installed two producer-gas fired Priest kilns (with an 11-ft. Morgan producer), which are operated on dry CO<sub>2</sub> blast in place of steam. The output is 112 tons per kiln per 24 hours, with a fuel consumption of 24 percent. The steel industry he said uses a large number of Priest kilns which are fired with a mixture of blast furnace-coke oven gas.

Mr. Gee reported that with the exception of agriculture, there is little market for pebble quicklime (smaller than 2-in.). Most of the quicklime is sold as lump lime (larger than 4 in.), and most of the pebble lime is hydrated. Nearly all of the hydrated lime is produced in Knibbs hydrators, although there are a few Knitzer and Clyde hydrators in use.

With only one accepted official specification in use (B. S. 890, relating to building lime), Mr. Gee said there is a tendency for each consumer to make his own specification. This creates serious problems. He noted a growing insistence of improvement of hydrate quality for chemical purposes; customers are demanding a very pure calcium hydroxide, with a stringent limit on the carbonate content, a good color, and a fineness of up to 99 percent passing 300 mesh. The speaker also noted increasing competition in the mortar field from plasticizers or air-entraining agents which are reputed to produce workable cement-sand mortars without the use of lime; this com-

petition has developed because England lacks plastic dolomitic finishing limes, such as produced in the U. S.

#### Future Meetings

The board of directors voted to hold the next annual convention at the Broadmoor Hotel, Colorado Springs, Colo., June 5 to 9, 1957. The next Operating meeting will be held October 10-12, 1956, at the Kentwood Arms Hotel, Springfield, Mo.

#### Chief Chemist

JOHN R. MORSS has been named chief chemist of the Texas Portland Cement Co., Orange, Texas, according to an announcement by Kent B. Diehl, Sr., president. A chemical engineering graduate of the University of Iowa, Ames, Iowa, Mr. Morss has had 16 years of experience in wet and dry process cement plants, three years research, and nine years of technical consulting, process studies and operation. A native of Iowa, he began his career in the cement industry in 1927 as a technician and analyst at Northwestern States Portland Cement Co., Mason City, Iowa, where he remained until 1939. He then joined C. M. Price, consulting chemical engineer, and established a quality control system at the Permanente Cement Co., Permanente, Calif. In 1947, he became an associate with Price & Anderson, consulting engineers of San Francisco, where he did analytical studies of raw material, quarry surveys, combustion studies, design of special cements, and grindability studies with direct application to plant operation.

#### National Gypsum Promotions

HOLGER PETERSEN has been named manager of the new Burlington, N. J., gypsum plant of National Gypsum Co., Buffalo, N.Y. He was formerly manager of the Baltimore, Md., plant and will be succeeded by Harold E. Beard, who has been production superintendent at the plant since 1953. Mr. Petersen was born in Brooklyn and raised in Rochester, N.Y., where he attended the Mechanics Institute. He had been associated with the Atlantic Gypsum Co. for five years when it was purchased in 1936 by National Gypsum Co. He was appointed assistant manager at the New York City plant and subsequently was consultant on mill problems in all gypsum plants. In 1952 he was promoted to manager of the Baltimore plant. Mr. Beard, a graduate of Pennsylvania State University, was born in Cornwall, Penn.

#### On Board of Directors

CARL H. BROWN, JR., secretary, Cleveland Quarries Co., Cleveland, Ohio, and Stanley H. Young have been elected to the board of directors of Silica Chemicals, Inc., Amherst, Ohio, a subsidiary of Cleveland Quarries Co. A graduate in ceramic engineering from Pennsylvania State College, Mr. Young formerly served as a ceramic engineer for the Republic Steel Corp.

#### Member of Controllers Institute

A. KEITH HARRIS, chief accountant, Dolese Brothers Co., Oklahoma City, Okla., has been elected to membership in the Controllers Institute of America, New York, N.Y.



New officers of the Texas Aggregates Association. Left to right: G. O. Rogers, Travis Materials Co., Austin, president; Allan Cunningham, F. M. Reeves and Sons, Inc., Pecos, vice-president; and John Van Amburgh, Wesco Materials Corp., Dallas, secretary-treasurer

Moving fast, this 550 Adams grader keeps pit floor clean, saving wear on fleets' tires and treads. Permits driving equipment by shortest routes, improves drainage.

This high-speed modern grader keeps haul-roads in first-class condition to speed movement of production haulers, reduce wear on tires and machines.



## Cut mining costs thru better clean-up

There are only two ways to increase your mining profits without a rise in the price of ore. You must increase production, or lower costs...or both.

You may think of your grader simply as a maintenance tool. But in the hands of a good operator, a versatile, modern high-speed grader increases mining production and cuts operating costs. Check these 9 big ways increased grader capacity can increase your profits.



Occasional spill over sides of heaped trucks...around hoppers, grizzlies, conveyors, and trestles...can litter concentrating plant area, slow traffic, damage tires. This Adams grader keeps this area clean by daily clean-up.

**1. Regular and more frequent maintenance of haul roads**—smooth roads speed hauling, save tire-wear, cut mechanical maintenance, improve safety.

**2. Quick clean-up after blast**—grader provides a fast, inexpensive way to move scattered fragments back against toe, thus protecting men, machinery, and tires working around pit, speeding up all pit operations.

**3. Clean pit floors**—regular routine of maintaining wide traffic ways that make all areas of pit quickly accessible pays off. Equipment can travel to any assignment by shortest route. Smooth access saves wear on tires and crawlers, improves drainage, prevent dirt and refuse from weathering into levels of ore below floor.

**4. Maintain good housekeeping around plant**—you need ample grader capacity to keep roads, runways, working areas around plant neat, clean, and workable at all times. Level or remove the occasional spill left by heaped trucks...from around hoppers, grizzlies, conveyors, trestles. Clean plant area speeds all mobile equipment operation around plant, reduces dust, improves safety.

**5. Keep stockpile toes pushed in**—weather and loading operations result in spread of toes around stockpile. This limits working space, wastes stored material. Also, working thinly-spread toes means inferior ore grades, increases loading cost. Regular grader service helps prevent this waste.

**6. Keep dumps smoothly spread and level**—regular grader service can spread dumped material clear over edge. Offset blade reaches far beyond leaning front wheels which hold against side thrust. A smooth, level, dry dump speeds hauling and dumping, cuts equipment costs. Grader can smooth haul road coming and going.

**7. Clean ore benches of washed-down dirt**—every rain washes dirt into upper benches, lowers ore grade. Prompt grader service halts "wash", provides planned drainage, piles washed-in material for easy removal by scraper or truck.

**8. Assist exploration teams**—a modern grader can build a well-graded and drained roadway in a matter of hours, speeds exploration work by maintaining good haul roads.

**9. Keeps drainage open**—in a few hours work per week, a modern grader will keep ditches clean, pit dry.

### Inventory capacity of your present graders

It will pay you to inventory the work capacity of your present graders. If they are more than a few years old, you will probably find a substantial saving in replacement with the faster, more powerful, big capacity graders currently on the market. We will be glad to assist by furnishing specifications and comparative statistics on our line of modern Adams graders.

Reprints available on request.

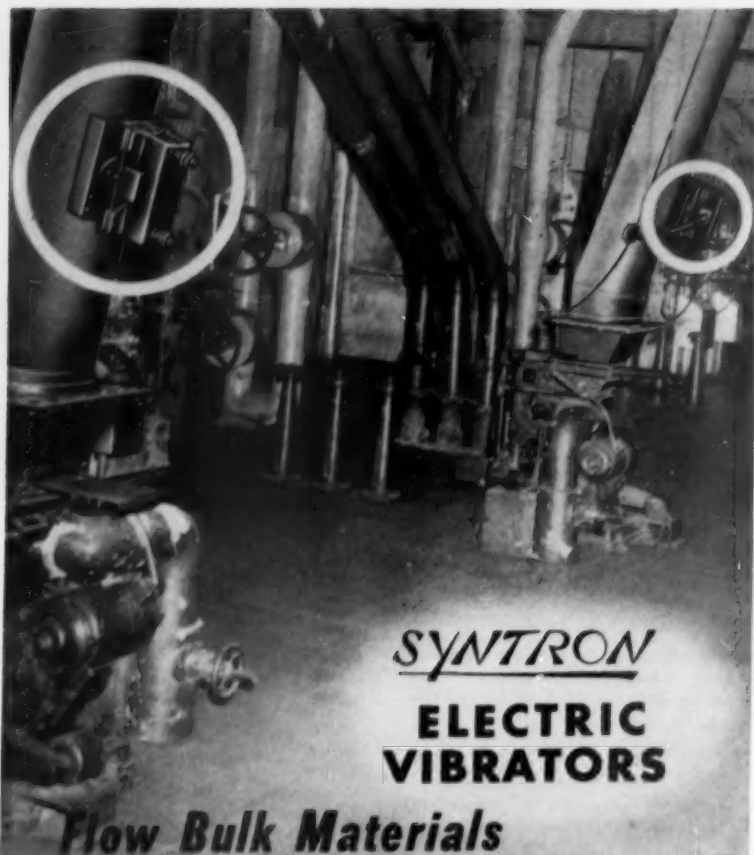
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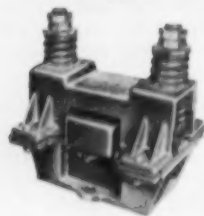
**LeTourneau-WESTINGHOUSE Company**

Peoria, Illinois

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## Flow Bulk Materials Through Hoppers, Bins and Chutes



3600 controllable, electromagnetic vibrations per minute prevent arching or plugging of the most stubborn bulk materials. Have no mechanical wearing parts that require maintenance. Compact — easy to install. Eliminate equipment damage from rodding, poking or sledging. In models and sizes for any bulk handling installation.

## Other Syntron Equipment of Proven Dependable Quality

**GRIZZLY  
FEEDERS**



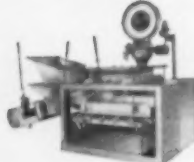
**FEEDER  
MACHINES**



**SHAFT  
SEALS**



**WEIGH  
FEEDERS**



SEND FOR COMPLETE CATALOGUE DATA—FREE

## SYNTRON COMPANY

450 Lexington Avenue

Homer City, Penna.

## HEATED SCREENS

(Continued from page 92)

by a vertically-mounted 60-hp. Crock-er-Wheeler motor. The crusher is started in two stages and is set with a  $\frac{5}{8}$ -in. c.s.s. and a  $\frac{3}{4}$ -in. o.s.s. The crusher product is returned to the screening tower by means of a 24-in. conveyor, 85-ft. centers, leading to the main conveyor. Quaker belting is used on both conveyors.

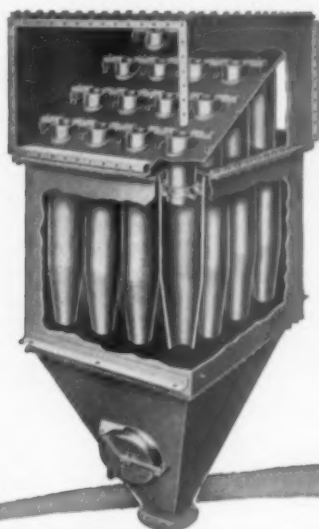
A special feature of the plant is the multiple electrical control stations which permit various units to be shut down from remote points in the case of emergency. Besides individual start-stop buttons at each operating unit, there is a set of start-stop switches at the loading bins (at ground level) for operating the screens, conveyors, and secondary crusher. Switches at the primary crusher permit operation of the feeder, jaw crusher, and main conveyor. Main switches are located in a centrally-located switch house. In addition, there are two alarms available for emergency stopping of the crushers. One, located in the switch house, warns of low oil pressure on the secondary crusher; the second, at the primary crusher, is sounded by the screen tower operator for emergency stoppage of the primary crusher and main conveyor. All plant equipment is operated on 440 volts. Incoming power at 1600 volts is stepped down by means of three 150 kv.a. transformers.

The Sidney plant was designed and manufactured by Kennedy Van Saun Mfg. & Engineering Corp., and Piqua Steel Corp., Piqua, Ohio, was the erector. The plant was erected in less than three months, and operation was started in September, 1955. Future plans call for expanding agstone production facilities and installation of stone dust processing equipment.

Miami River Quarries, Inc., is a stock company, 95 percent of which is owned by some 72 residents in the Sidney area. The company was capitalized at \$150,000. Officers are Ralph W. Kerr, president and general manager, Chas. E. Buel, Sr., vice-president; and L. E. Bauer, secretary-treasurer and counsel. Mr. Kerr was formerly a district sales representative of Marion Power Shovel Co.; and Mr. Buel was a former co-owner of Rockford Stone Co., Rockford, Ohio, and has been active in quarrying for the past 33 years. W. C. Reiff, a veteran of 42 years in the quarrying industry, is general superintendent.

MAULE INDUSTRIES, INC., Miami Beach, Fla., has purchased Seminole Rock & Sand Co. at Miami. The plant is located on a 300-acre site.

Before you buy any equipment for recovering dust . . .



# COMPARE ALL OTHERS against MULTICLONE'S Multiple Advantages

Because the advantages of MULTICLONE are so clear-cut, so vitally important, so far-reaching in the savings they make, we urge you to make a factual unbiased comparison of MULTICLONE dust collection equipment against any other in the mechanical recovery field. Only by making such a comparison can you fully appreciate the major savings and greater performance you get by installing MULTICLONE Collectors!

## COMPARE Recovery Efficiency!

It is a recognized fact that the separating efficiency of a cyclonic tube increases as the tube diameter decreases because smaller tubes generate greater centrifugal forces. The patented vane in the MULTICLONE makes the use of small tubes practical without complicated manifolding and permits compacting many small tubes into one simple, highly efficient unit. MULTICLONE's higher centrifugal forces throw out not only the large, medium and small particles, but also an unusually high percentage of the extremely small particles of 10 microns and less. Result—more complete recovery of all suspended particles from the gas stream!



## COMPARE Space-Saving Compactness!

Plant space costs money—particularly at today's high construction costs. Because the MULTICLONE is more compact, size for size, it makes really important savings in space and plant costs. Note in the chart how the MULTICLONE requires substantially less space—both in floor space and cubic space—than any other unit of comparable capacity and performance. This means vital savings in construction costs!

Make	Relative Space Requirements	
	In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

## COMPARE Dollar-Saving Adaptability!

Savings in space is just one of many ways MULTICLONE reduces installation costs. Because the shape of the unit can be readily varied (long and narrow, short and wide, or square) to fit available spaces, the MULTICLONE can often be tucked into odd corners and waste areas too restricted for other equipment.

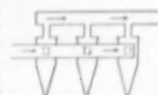
Moreover, inlet-outlet ducts can be varied—side-inlet side-outlet, or side-inlet top-outlet—to meet low headroom or restricted side clearance requirements . . . and the single-inlet single-outlet duct design permits greater flexibility and simpler installation. These all add up to vital savings in installation costs!



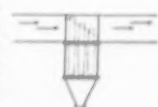
Side inlet, Side inlet,  
Side outlet Top outlet

## COMPARE All-Around Simplicity!

The MULTICLONE is simple and inexpensive to maintain because there are no highspeed moving parts to repair or replace . . . no pads or filters to clean or renew . . . nothing to choke the gas flow or increase draft losses as suspended materials are recovered. In addition, the square, flat-sided shape of the MULTICLONE and its straight inlet and outlet ducts are far simpler to install and insulate. And since the recovered material from an entire bank of tubes is collected in a single hopper, it is much easier to service and maintain than the multiple hoppers of conventional cyclone units. Here again, the MULTICLONE saves in many ways—all of them important!

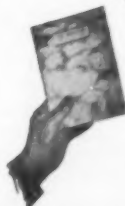


Conventional Cyclone



Multiclone

Whether your recovery installation is in a new structure or for modernizing present equipment, you will be far ahead by installing MULTICLONE Collectors. Our experienced engineers will gladly make helpful suggestions for simplifying your recovery problems. A letter, wire or call to our nearest office places this assistance at your service without obligation.



**Send for Helpful Literature!** This factual MULTICLONE literature explains the basic principles of cyclonic dust recovery and gives technical data helpful to anyone contemplating a dust or fly ash recovery installation. Write today for your free copy!

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DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR  
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PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL



Yuba designed this screen for long life, minimum maintenance. Inner and outer screens easily renewed. Can be lubricated from outside.

## HEAVY-DUTY SCREENS MADE TO FIT YOUR NEEDS

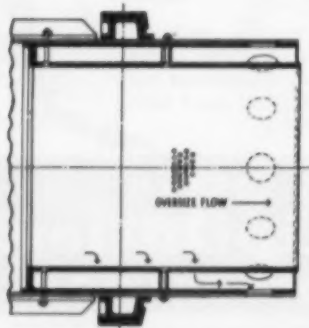
Flat or revolving • long-wearing  
non-clogging • competitively priced

—order from **YUBA**

**For example** — this double-jacketed screen, 35' long and 8' in diameter, washes and screens three sizes of sand simultaneously. Yuba-built screen plates are made from Abrasion Resisting Steel plates with a hardness ranging up to 250 Brinnell. This is a high carbon, high manganese alloy steel produced especially for screening purposes. In many places, screens of this tough, abrasion resisting steel last twice as long as ordinary screens. Naturally, this reduces downtime and replacement costs.

Yuba taper-drills screen holes to prevent clogging (unless you request straight sides). Holes can be as small as 3/16" diameter; closely spaced for screening monazite sands and other rare earths. Thicknesses from 3/16"; length, diameter and other dimensions to suit your needs. Yuba screen plates are rolled true and cut square to close limits — insuring proper fit and fast installation.

Yuba stocks abrasion resisting steel in many thicknesses, usually can make prompt delivery. Try long-wearing, non-clogging Yuba screens now. For estimates, send screen details, hole sizes and spacing. No obligation. Wire, write or phone TODAY.



Yuba-built Olsen trommel increases screen capacity as much as 25%, by converting lower end blank shell plates into screening area... does not increase screen length.

102



## YUBA MANUFACTURING CO.

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## TRIEF CEMENT

(Continued from page 98)

In 1948, the attention of the Hydro-Electric Board was drawn to the use being made of wet-ground blast furnace slag in the construction of a large dam by the French Electricity Board at Bortles-Orgues in Central France. It was decided to send a deputation to France, consisting of two engineers and a chemist, to get fuller details. The reports received were encouraging and tests were then made at the Royal Technical College, Glasgow, using the blast furnace slag available from Scottish steel works where there are ample supplies. The result of these tests were satisfactory.

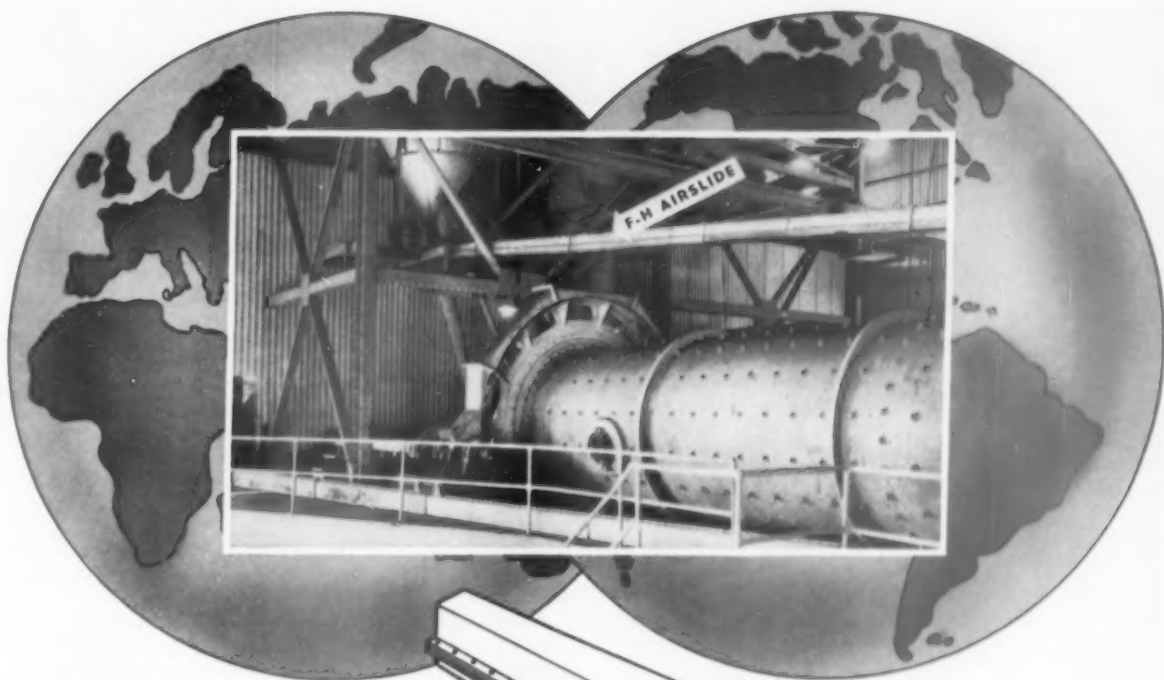
The Mitchell Construction Co. Ltd., expressed their interest in the Trief process to the extent of basing their tender for the Upper Glen Moriston works upon it. They have overcome the many difficulties of developing a new process in this country for the first time, and have now reached the stage at which the complete manufacturing plant on the site has been constructed, has been through its trials and is in operation.

Slag for the cement is brought to the Cluanie batching plant by highway from Messrs. Colville's steel mills in Lanarkshire. It is stored in the open because it is inert and needs no protection from the weather. From storage it is fed to the mills where the slurry is produced by the wet-grinding process. There are two grinders, each capable of producing 5½ tons of slurry an hour. This slurry is sampled and checked for its chemical consistency and is fed into tanks which, as the slurry must not be allowed to settle, are fitted with agitators. The slurry is pumped from the tanks to the batching plant where it is mixed with sand and aggregate and with an appropriate proportion of portland cement to make the finished Trief product.

The batching plant has been erected near Cluanie dam where the majority of the concrete needed for both dams and for other works will be mixed. There are three concrete mixers in the batching plant, two of 2-cu. yd. capacity and one of 1-cu. yd. capacity. The control of all the supplies of sand, stone, ground slag and cement to the concrete mixers is carried out by one man operating a number of push buttons on a control board.

"The concrete is placed in the Cluanie dam by means of two overhead cableways. Each cableway is of 10-ton capacity and spans the dam from end to end. The method of control is by walkie-talkie radio.

"A granite quarry has been opened near the Cluanie dam, and equipment



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F-H AIRSLIDE®  
AIR-ACTIVATED GRAVITY  
CONVEYORS**

North, South, East, West, to the four corners of the earth, F-H Airslide® air-activated gravity conveyors are handling thousands of tons of many types of material, and, they're doing it at the very lowest cost per ton.

There are many good reasons for the universal acceptance of this conveyor. Simplicity of construction and installation. Comparatively light in weight, it can be suspended from overhead or placed on the floor. No moving or working parts, maintenance is nil. Nothing moves but the material and air. Benefits are constant and substantial.

Power—exceedingly low. Small fan or blower is sufficient to supply air at low pressure to fluidize the material being handled,

which flows by gravity on a slightly inclined plane, the degree of slope depending upon the material conveyed.

Illustrated above is an Airslide installed in a cement plant in the Philippine Islands, conveying oversize material (rejects) in the finish grinding mill circuit from separator to mill for further grinding. Airslide is 10' in width and 50' in length and handles 500 bbl. of finished cement tailings an hour. The only power required is a 2-hp. blower. Quiet, clean, efficient, low-cost conveying and, no moving parts to wear or get out of order.

The next time you are in need of conveying dry, fine materials, consult us. It may mean substantial savings you never thought possible.



FH-52  
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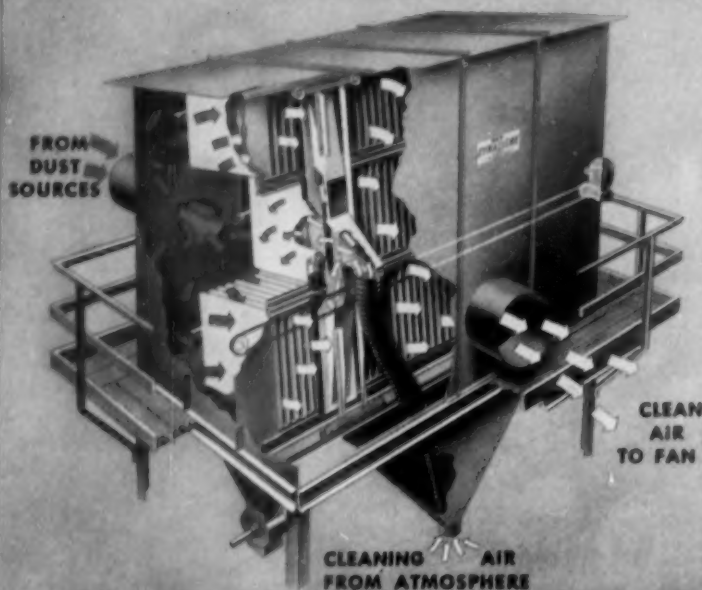
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The first reverse air cleaning unit produced in the United States, the SLY Dynaclone has proven during the past six years that it is the most efficient dust filter ever made. It operates continuously — reclaims all the dust to keep plants clean. Thus, valuable material is saved, worker comfort and efficiency improved, cleaning and maintenance costs reduced. The original self-cleaning dust filter, the Dynaclone is manufactured by SLY, pioneer and leader in dust collection equipment and original patentee of the cloth-type filter.

### MANY IMPORTANT ADVANTAGES

- Constant suction at dust sources
- Self-cleaning for continuous operation—no mechanical shaking
- No auxiliary motors or blowers—the main operating fan does the cleaning
- No abrasion of bags by the cleaner—minimum maintenance
- Compactness for space-saving installation
- Advanced design for ease of installation

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### HOW IT WORKS

Dust-laden air is drawn in from dust sources, diffused into dust chamber by baffle plate, drawn through fabric of filter bags and cleaned. Clean air passes out the case and into suction fan. Concurrently, traveler moves back and forth across dust wall, registering successively with one bag at a time. Suction existing in the dust chamber draws atmospheric air through the bag in reverse direction, cleaning the bag.

has been installed to give an output of up to 200 t.p.h. This provides both coarse and fine aggregates for all the concrete needed on the site.

"The aggregate is normally fed from the quarry by conveyor to the batching plant feed hoppers. Stockpiles of graded aggregate will be held in reserve on a site near the quarry.

"Two Dams are at present being built: the smaller, at Loch Loyne, approximately 1745 ft. long and 61 ft. high; the larger, at Loch Cluanie (on the River Moriston), approximately 2165 ft. long and 118 ft. high. Both dams are of the gravity type. Instead of using shuttering (forms) in the construction of the dams, the contractors have designed pre-cast blocks, each weighing about two tons, to form the external faces. This is the first time that they have been used for the construction of a large dam in Britain. Over 90,000 cu. yd. is being excavated for the Cluanie dam which, when complete, will contain 250,000 cu. yd. of concrete. The Loyne dam involves 55,000 cu. yd. of excavation and will contain 60,000 cu. yd. of concrete.

"There will be a small generating station in Cluanie dam to produce power from the compensation water which is to be sent down the Moriston River. There also will be a small generating station in the Loyne dam to produce power from the flow of water passing through the Loyne tunnel to Cluanie reservoir.

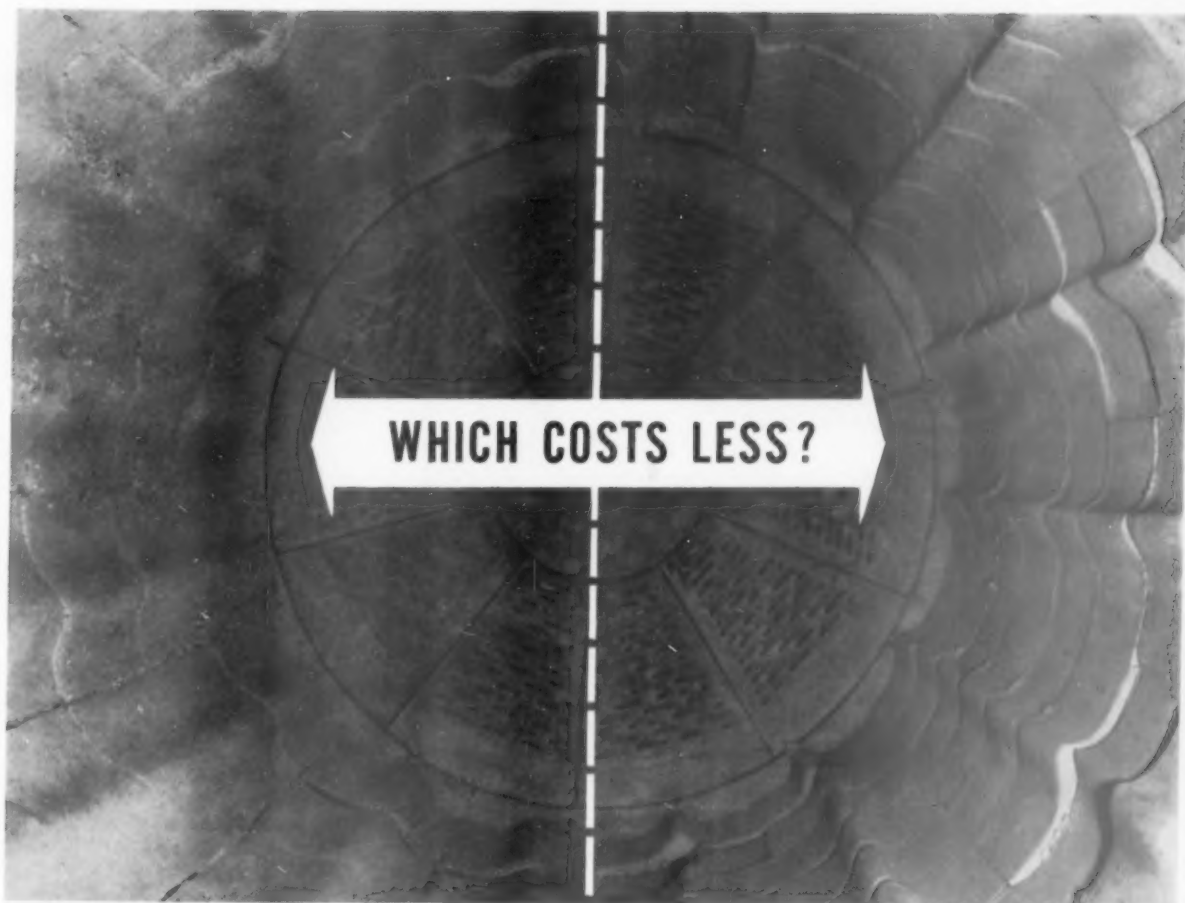
"All the tunnels are of horseshoe section. On the Ceannacroc tunnel two adits were driven to provide additional working faces. Driving has proceeded on a maximum of five headings simultaneously and aggregate distances of up to about 1000 ft. a week have been driven. The driving of the tunnels from Loch Loyne to Loch Cluanie and from Loch Cluanie to the power station at Ceannacroc is now completed. Both tunnels have an approximate equivalent diameter of 12 ft.

"The Power Station at Ceannacroc will be underground. The capacity of this station is to be 20,000 kw."

### Freight Hike Does Not Apply

ALTHOUGH A 6 PERCENT INCREASE in within-the-state freight rates of Illinois railroads has been granted by the Illinois Commerce Commission, the increased rates do not apply to sand, gravel and crushed stone, shipped in open top cars. The commission recently authorized a similar increase in interstate freight traffic rates.

BARTON SAND AND GRAVEL, INC., Austin, Texas, was incorporated by R. L. Struhall, Jr., S. R. Sheppard, and Wroe Owens, with an authorized capitalization of \$10,000.



#### ***Low cost-per-pound steel liners?***

Here's what happened when ordinary steel liners were operated in the same mill with ABK Metal liners. You can easily see the difference in wear in this photograph.

#### ***Low cost-per-ton\* ABK Metal liners?***

\*Low cost per ton of material ground, of course. The slight additional first cost of ABK Metal is more than offset by its extra life, by reduced labor, by savings in equipment down-time.

## **ABK<sup>®</sup> METAL cuts cost 3 ways**

1. ***Lasts longer*** . . . costs less per ton of material processed.
2. ***Slashes labor expense*** . . . of frequent liner replacement.
3. ***Prevents down-time*** . . . avoids costly losses in production.

Yes, three to four times normal life can be expected when ABK Metal replaces ordinary liners. That's because of its extreme hardness (500 to 700 Brinell) and very high resistance to abrasion. A controlled structure nickel-chrome iron, ABK Metal is produced only by American Brake Shoe.

AMERICAN

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COMPANY

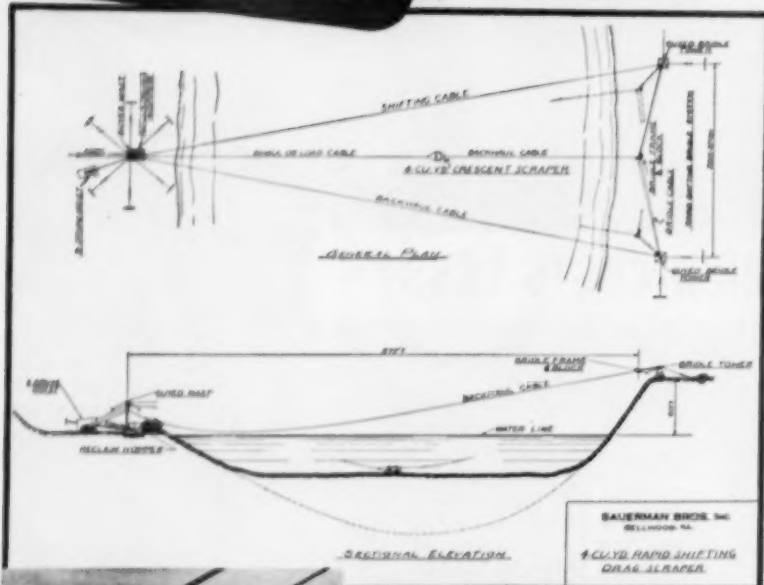
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# the SAUERMAN METHOD....

**Scraper Machines  
Engineered to  
Your Operation**



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.



View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying lead to reclaiming hopper just in front of mast.

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits... on hills, swampy ground or underwater... handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

## PUSH-BUTTON PLANT

(Continued from page 110)

to the ground and is stocked by a front-end loader or is pushed aside by a tractor-bulldozer. Some concrete gravel requires 20 percent crushed material. All crushed gravel is processed dry. Wire screen cloth used at the plant is said to give exceptionally long service.

Sand is recovered by twin Tel-smith sand screws. Water for the operation is pumped from the Columbia river via a 4-in. pump powered by a 40-hp. motor.

A centrally located control station is a feature of the operation. The operator can see all the important operations from his station. Each operation is controlled by a push button, and one button is available to close down the entire plant during an emergency. Belt conveyors are used throughout the operation, and the plant operates without cover. Three men run the plant, and two additional men are used in stockpiling and loading phases. Coarser aggregates are stored in four bunkers, each holding 40 cu. yd. Sand is ground stored by a stacker belt. The coarse aggregates are ground stored by trucks and are reclaimed with a Wagnermobile dual-way scoop and a Barber-Greene loader.

All material now is hauled from the plant by trucks, although the operation is so located—only a stone's throw from the navigable river—that river barging is contemplated for the future. Most of the new plant's output is going into Pasco and Kennewick. The company has an important ready-mixed concrete operation at Kennewick. That plant was described in *Rock Products*, November, 1950, page 113.

District manager for Pre-Mix Concrete, Inc., with headquarters at the



Jack Tustin, plant superintendent, standing next to switch panel that controls major equipment

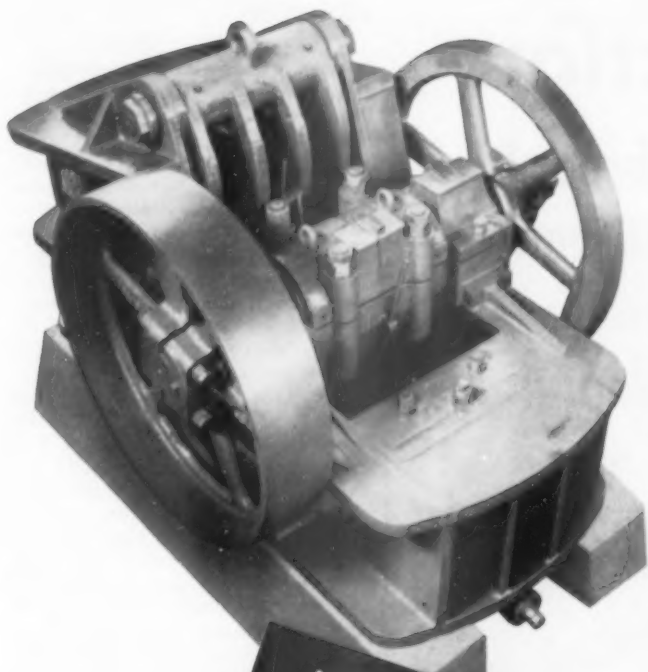
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## AN UNBEATABLE COMBINATION FOR MORE PROFITABLE MATERIAL CRUSHING



For over a half-century Traylor has been designing and building heavy-duty primary crushers for the nation's leading producers. These operators know from experience that the job-proven features of Traylor Jaw Crushers assure greater hourly output, lower production costs and longer, maintenance-free operation.

Traylor original non-chokable curved jaw plates apply power more efficiently . . . as a direct crushing force. The increased capacity of each successive feeding zone in the crushing chamber reduces choking and packing. Normal wear, as it gradually occurs, is evenly distributed over the entire surface of the plate . . . as a result *Traylor curved jaw plates often outlast conventional plates by as much as 3 to 1.*

As a direct result of their more efficient application of crushing power, Traylor Jaw Crushers require less power per ton produced than any other jaw crushers. Traylor Jaw Crushers are built in four different types, each in a wide variety of sizes. Feed openings range from 8" x 12" to 60" x 84"; capacities from 4 to 1000 tons per hour.

Write for copies of Traylor Jaw Crusher Bulletins giving complete specifications, illustrations and descriptions.

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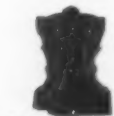
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HIGHER TONNAGE  
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REDUCED MAINTENANCE

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# JAW CRUSHERS



PRIMARY GYRATORY CRUSHERS



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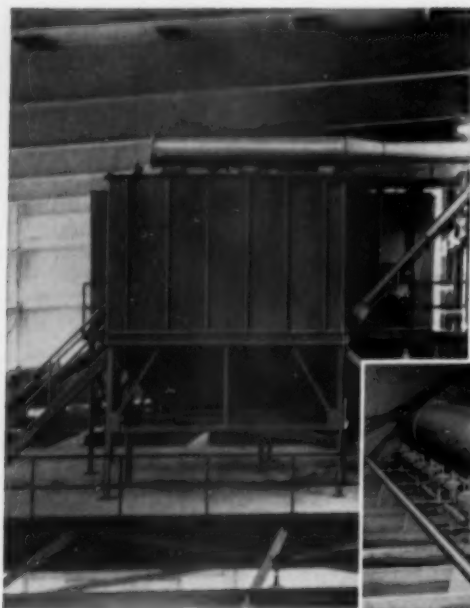


JAW CRUSHERS

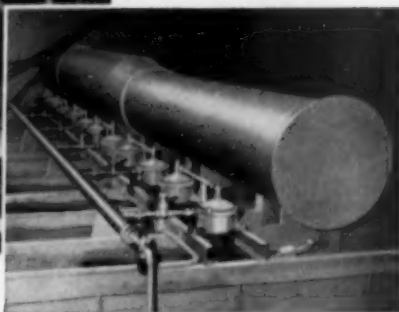


APRON FEEDERS

# Norblo gives you continuous peak-load Dust Collection



through  
automatic  
bag  
cleaning



Plants running full blast can ill-afford down time for equipment repairs and maintenance. Dust collection around the clock without interruption is commonplace with Norblo Automatic Bag Type Arresters.

Complete time-cycles for progressive automatic bag shaking are controlled by highly efficient electric timers. Only one compartment is cut out at a time, and that for just a few seconds, with no drop in efficiency for the installation as a whole. Norblo's compartment construction is the time-saving solution to inspection, maintenance and repair in busy plants . . . For "good housekeeping" or for salvage, Norblo Automatic installations have many design advantages wherever continuous high recovery of industrial dusts and fumes is important.

It pays you to write at once for latest information on Norblo Automatic Bag Type Dust Arrester that assures constant high efficiency dust handling.

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**Norblo** ENGINEERED DUST COLLECTION SYSTEMS  
FOR ALL INDUSTRIES

Kenniwick plant, is Chuck Noyes. Jack Tustin is plant superintendent. H. D. Sullivan is vice-president, and W. M. Murphy and John W. Murphy are partners in the Union Sand and Gravel Co. The latter is past-president of the National Sand and Gravel Association.

## URANIUM

(Continued from page 116)

a large machine shop, electric shop, diesel repair shop, instrument shop, and parts warehouse. The latter is stocked with material and parts valued at more than one million dollars. In order to permit maintenance crews to make needed machine repairs, replace worn parts or do such essential jobs as oiling and packing of bearings, each plant or mine operation shuts down for one shift about every third week.

The northwest end of the service center building is occupied by the locomotive service area. Adjoining is the tractor repair section and the automotive and tractor engine shop. The electrical shop does all needed work except motor winding. A 15-ton P & H traveling crane operates the full length of the heavy machine area.

Shop equipment includes a 9- x 36-in. Sheldon bench lathe; four R. K. LeBlond engine lathes; one Model No. 4 Cincinnati miller; one 60-in. American Tool Works radial drill; a 24-in. Cincinnati shaper; a 3/4 x 72-in. Webb bending roll; a Model J-6 mild steel sheet metal shear made by Niagara Machine & Tool Works; a 200-ton wheel press; a 2-in. to 6-in. Toledo pipe threading machine and miscellaneous smaller pieces of equipment. W. F. Carter, maintenance superintendent is in charge of the Service Center which employs 175 men including drivers.

Early phosphate mining and processing in the Bartow area began in 1903 at Prairie, near Mulberry, Fla. The operating company was first the Prairie Pebble Phosphate Co. which operated two 12-hr. shifts a day for some years and employed about 75 men. In 1909, Prairie Pebble was purchased by the International Agricultural Corp., which grew rapidly in scope of operations and became a leader in the phosphate mining field. In 1941, International Agricultural Corp. changed its name to International Minerals & Chemical Corp. The parent organization is credited with doing the laboratory research which led to the adoption of the flotation process.

The first commercial shipment of concentrates from Florida mines made by the flotation process, was in 1928. About the same time International began operating the first electric-powered

(Continued on page 178)

See one of the following Simplicity dealers for information on this or any other Simplicity equipment.

#### ARIZONA

Arizona Equipment Sales Inc.  
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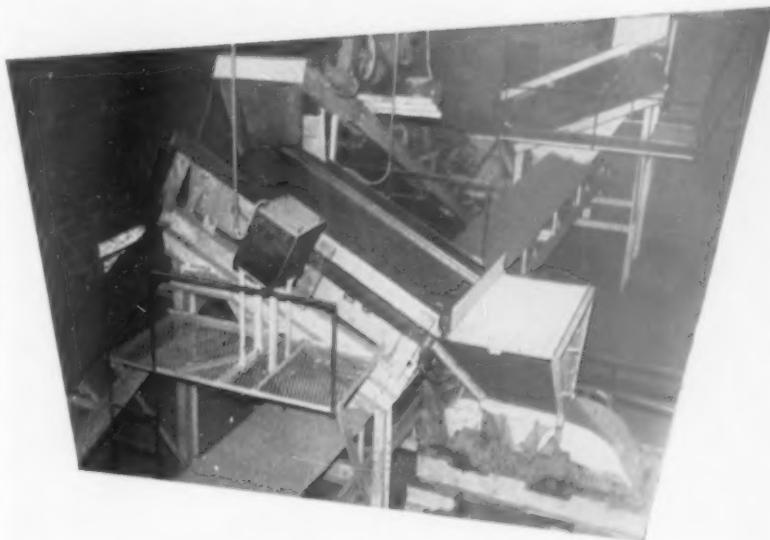
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... and speed production  
with **SIMPLICITY**  
4' x 8' heated screen



At this large brick and tile plant in North Carolina, three Simplicity Heated Screens are speeding processing of red clay and shale clay . . . the first screen is handling a minimum of 100 tons per hour! The red clay is extremely moist at all times of the year, and before heated screens were employed, severe blinding resulted. Now, with the Simplicity Heated Screens in operation, production is at a high level and down time almost nil. The Simplicity models at work here include three 4' x 8' Heated Screens, one with a ball tray deck. For economy of operation Simplicity heated units employ end-to-end application of current. This results in high resistance and uniform distribution of heat over the entire screen surface with lower operating current. Simplicity's fully balanced, high speed, short stroke assembly provides equal vibration over the entire deck area and none in main frame and supporting structure. Specially designed transformers are dust-tight special units with built-in overload switches to prevent burning out. Transformer is designed to heat either stainless steel or carbon steel cloth at no extra cost. Write today for information on Simplicity Heated Screens.

For further information on Os-A-Veyor Feeders, Conveyors, Gyration Screens and Woven Wire Cloth, write . . .



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You can tell Naylor pipe from other lightweight pipe by its familiar spiral. But what you can't see is the extra performance built into this lockseamed, spiralwelded pipe.

First, there's extra strength and safety, thanks to the spiral truss which acts as a continuous expansion joint to absorb shock loads, stresses and strains. Next, there's greater collapse strength that lets you use Naylor under both vacuum or pressure. Also, the Naylor structure maintains its true cylindrical form and holds its diameter accurately.

Once you use Naylor pipe for air lines, water lines, tailings lines or ventilating, you'll recognize what a difference this extra performance makes.

Write for Bulletin No. 507.



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draglines used in Florida phosphate mining. International is now operating mines and manufacturing plants in 21 states from coast to coast.

## Official Personnel

George W. Moyer is vice-president, F. A. Koechlein, general manager and Floyd B. Bowen is production manager for the Phosphate Minerals Division. E. T. Casler is assistant manager-production and H. T. Loehr, Jr., assistant manager-engineering. Other key personnel in the division include: M. T. Smith, mining superintendent; J. L. Robison, flotation superintendent; J. Patrick, traffic manager; J. L. Frye, preparation superintendent; H. M. Feigin, property superintendent; H. E. Uhland, chief metallurgist; H. H. Edwards, chief chemist and W. O. McClintock, chief engineer.

Howard F. Roderick is vice-president in charge of the Phosphate Chemicals Division. William Bellano is production manager.

## ROCKY'S NOTES

(Continued from page 23)

where. We have described in previous articles in *ROCK PRODUCTS* how the tetrahedral group of one silicon and four oxygen ions is the basis of all the silicate minerals, and undoubtedly of hardened cement as well. Dr. Hauser's explanation of how these silicates were probably formed is expressed as follows: "From a colloid-chemical point of view it seems plausible that the silicates formed by various combinations of tetrahedral silicon-oxygen groups originated from simple hydrous silicates and developed by condensation polymerization." That last big word merely means a coming together of many various groups.

Particularly valuable to a study of cement is the chapter on "Silicic Acid and Silica Gels," with its discussion on theories of silicic acid gel structure. The adsorption of metallic ions on silica gel particles (colloidal micelles) is apparently the starting point in the formation of all the more complex silicates, of which hardened, hydrated portland cement is a prime example. While this phenomenon has been studied extensively in connection with clays, it is only recently that cement researchers have seen the parallel problem in their own work.

As we have pointed out in the preceding discussion, Dr. Hauser does not discuss cements; he does discuss to a slight extent the structure of glass, the silicones, and other artificial silicates. However, we believe there is much to be learned from his work by one who wishes to study silicates, including cement and concrete.

# Why this is the lowest-cost reduction crusher

● Dollar for dollar, pound for pound, the PIONEER Roll Crusher is the most efficient and economical crusher you can buy.

Why? Because of its simplicity. In principle, it's just as simple as the old hand wringer you used to turn on wash-day as a kid.

This simple, rugged construction gives you five important savings that in total, can't be matched by any other type reduction crusher.

**Save in initial cost.** In any given capacity, a roll crusher costs less initially than other types of reduction crushers.

**Save in installation cost.** Its strong, simple design eliminates unnecessary weight, thus making it easier to install than other types with equal capacity. The sturdy, built-up, reinforced base has ample clearance for installing a conveyor underneath, without extra foundation cost.

**Save in operating time.** Adjustment is quickly and easily accomplished by turning four bolts. Lubrication takes only a few minutes with a grease gun. PIONEER Roll Crushers do not get clogged.

**Save in power.** Round rolls serve as flywheels to build momentum, thus giving efficient use of power and smooth performance.

**Save in maintenance.** Safety springs protect equipment by allowing passage of uncrushable material, and sturdy construction keeps breakage and wear at a minimum. Bearings are placed close together on oversize shaft to prevent undue strain. Chrome-molybdenum steel drive gears, completely enclosed and running in oil, last for lifetime of crusher.

When maintenance is necessary, all parts are readily accessible. Roll shells, for example, are readily slipped off hubs without disturbing bearings on the shaft.

## SPECIFICATIONS

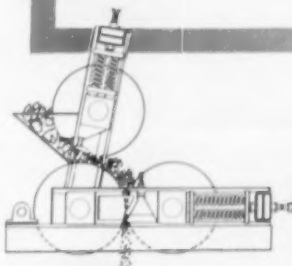
PIONEER Twin Roll Crushers	Model 24x16	Model 30x18	Model 40x22	Model 50x24
Max. stage of reduction* (in.)	1 1/4	2	3	4
Max. size of feed (in.)	3 1/2 x 3 1/2	4 1/2 x 4 1/2	6 x 6	8 x 8
Cap. in tph** (Max. size of product: 1")	52	66	95	128
Recommended horsepower	55	75	100	125
Approximate weight (lbs.)	8500	11000	20000	38000

\*Based on use of coarse corrugated shells on each roll of three larger crushers, fine corrugated shells on 24 x 16.

\*\*Capacity may vary  $\pm$  25%, depending on type of material.

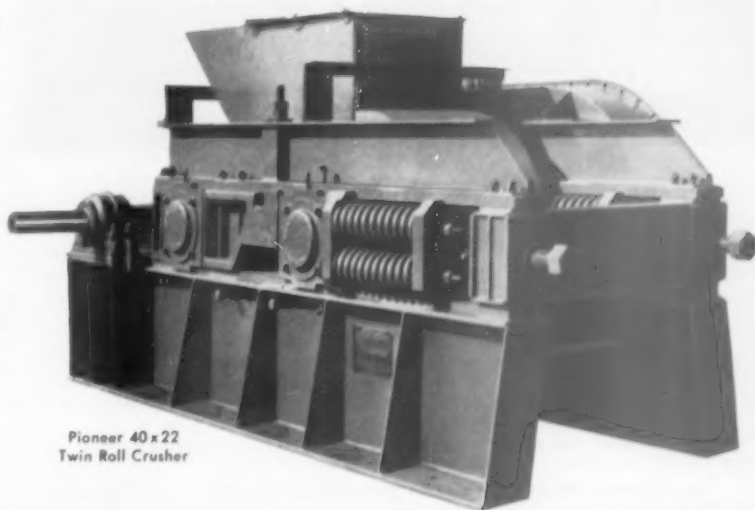
## Ask your crusher salesman these questions

1. How does initial cost compare with other crushers of equal capacity?
2. How much power will it require?
3. How is it driven (chain or gear)?
4. How close are bearings placed on shaft?
5. Do cheek plates and feed hopper permit utilization of entire roll shell for crushing?
6. How much does it cost to replace manganese steel wearing surfaces? How long does it take?



To increase stage of reduction, just add a third roll and you have a Triple Roll Crusher... a crusher that does the work of two!

Available as skid-mounted unit complete with power.



Pioneer 40 x 22  
Twin Roll Crusher

For further details, write Pioneer Engineering Works, Inc., Minneapolis, Minn. (subsidiary of Poor & Co., Chicago) or nearest PIONEER Distributors.

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 12, Minn.  
Subsidiary of Poor & Company • Chicago  
Please send information on equipment checked.

- ☐ GRAVEL PLANTS ☐ WASHING PLANTS ☐ MECHANICAL FEEDERS  
☐ ROCK PLANTS ☐ BITUMINOUS PLANTS ☐ VIBRATING SCREENS  
☐ JAW CRUSHERS ☐ APRON FEEDERS ☐ BUZZER SCREENS (LIGHT DUTY)  
☐ ROLL CRUSHERS ☐ GRD FEEDERS ☐ CONTINUOUS CONVEYORS

Name \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**BUY BOTH!**  
 HIGHER OUTPUT  
 LOWER UPKEEP

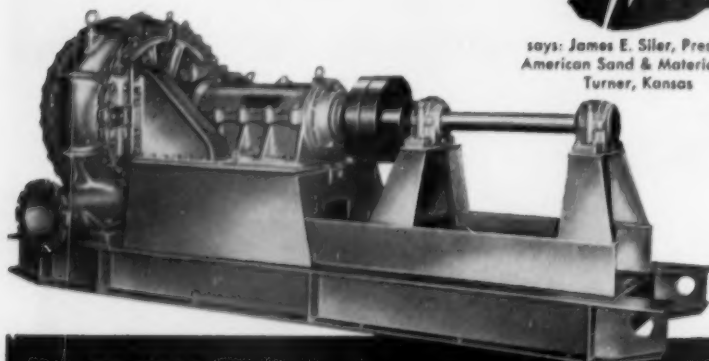
# Pioneer

Continuflow EQUIPMENT

"We Ran Our Morris Pump  
for 25 YEARS...and then  
Doubled its Load!"



says: James E. Siler, President  
American Sand & Material Co.,  
Turner, Kansas



**NOW**... combining the lower speeds and outstanding  
reliability of the Morris Type "F"

**AND** the modern hydraulic design, high heads  
and efficiency of the Morris Type "G"...

## THE NEW MORRIS DREDGE PUMP

*Jim Siler's experience is typical of long-time Morris owners. Heavy, rugged, dependable Morris equipment has been the first choice for abrasive-handling pumps for nearly 90 years.*

Morris pumps are engineered to give uninterrupted, year-in-year-out handling of solids at any consistency that is fluid. Some important features of the new Morris GA and GAF Dredge Pumps:

**Oversize Shaft and Bearings** — easily withstand vibration and shock loads for longer on-the-line service and lower maintenance costs.

**Heavy Volute Casing** — thicker at points of greater wear, plus a choice of various alloys to increase internal life.

**Economical Impeller Design** — insures even wear. An enlarged suction shroud maintains effective pressure balancing and high efficiency.

Write today for a complete catalog, or better still, let our engineers help you select the right pump size for your particular needs. No charge or obligation.

### MORRIS MACHINE WORKS

Baldwinsville, N. Y.  
Sales Offices in Principal Cities

**MORRIS**

*Centrifugal Pumps*

### FOR BITUMINOUS MIXES

(Continued from page 126)

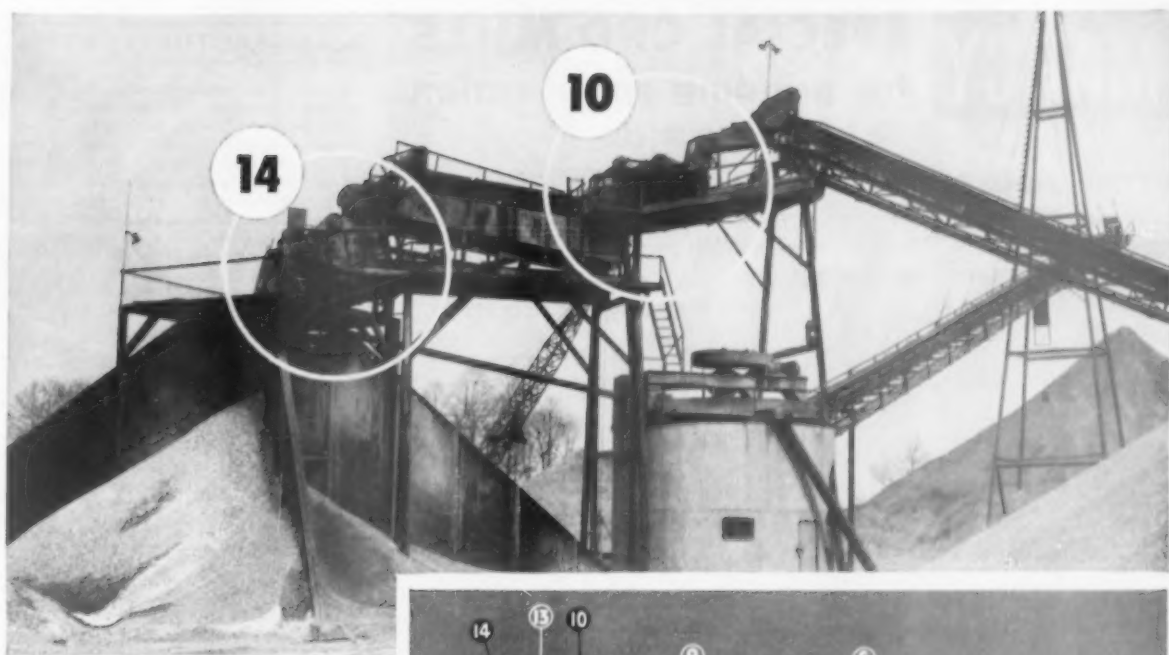
Of special interest is the dual water supply for washing plant operation, which consists of clear water pumped to the 16-ft. screen sections of the revolving scrubber screens, and less impure settling pond overflow water pumped to the scrubber sections. Well water is obtained at 600 g.p.m. from a 500-ft. well located on the property by a 6-in. Deming deep well pump (30-hp. motor drive). Water for the scrubbers is pumped from the settling basin at 600 g.p.m. by a 4-in. Gardner-Denver centrifugal pump (30-hp. motor drive). The pond is U-shaped, and the secondary water is drawn from the clear end, i.e., opposite from end receiving the tailings. In the plant operation, wash water from the trommels is discharged to the sand screws, and the overflow from these units is piped to the settling area. Fines are later reclaimed from the pond for use in hot mix asphaltic concrete.

The company operates a fleet of 15 trucks at the Osseo plant. Four 5-cu. yd. G.M.C. units are used on stockpiling, the remainder on deliveries. The latter includes six International tandem units fitted with Daybrook bodies, and five 5-cu. yd. G.M.C. units. Two Caterpillar D7 tractor-bulldozers are used in stockpiling sand and for general cleanup work. Loading from stockpile is handled by Allis-Chalmers HD19 and HD5 tractor-shovels.

Eugene Barton is president of the company and L. M. McGray, secretary-treasurer. The company, founded in 1946, also operates (at other locations) a Universal 880 Gravel-master (senior) portable crushing plant and two continuous hot mix asphalt plants (one a complete Pioneer plant and the other incorporating a Barber-Greene mixer and Pioneer dryer). In addition, the company handles asphalt paving jobs in the state of Minnesota. The Osseo property is used as winter headquarters for the company's truck and road building equipment. A 28-x 48-ft. Armco steel building is used as a warehouse and for repair work.

THE SUPERIOR SAND AND GRAVEL Co., Twin Falls, Idaho, was recently incorporated by H. M. McKibben, W. W. Schnoor, and R. H. Lowe, all of Twin Falls, and W. C. Schultheis of Seattle. Authorized capitalization was \$100,000.

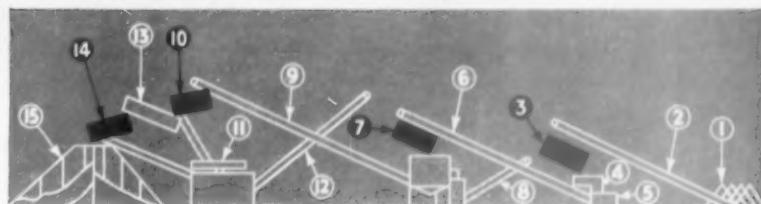
B & B ASPHALT Co., Inc., Atchison, Kan., has been granted a corporation charter to operate a general construction business. Capitalization of \$50,000 was authorized, with John Bronx named resident agent.



### Flow Chart

Material is passed through a grizzly (No. 1) and conveyed (No. 2) to a Deister double-deck, 4' x 8' Vibrating Screen (No. 3).  $+2\frac{1}{4}"$  material is scalped to the primary crusher (No. 4) and then fed (No. 5) onto the secondary conveyor with the  $-2\frac{1}{4}"$  material and conveyed (No. 6) to a Deister double-deck, 5' x 10' Vibrating Screen (No. 7) where  $+1\frac{1}{2}"$  is scalped to a crusher and recirculated (No. 8) with  $-1\frac{1}{2}"$  material (No. 9) to a Deister double-deck, 5' x 10' Vibrating Screen (No. 10). From this screen, concrete sand is sluiced to a dewaterer (No. 11) and conveyed (No. 12) to stockpile.

Material passing over the Deister Screen enters a log washer (No. 13), is washed and discharged onto a Deister triple-deck, 5' x 10' Vibrating Screen (No. 14). Here material is sized in four grades:  $-1\frac{1}{2}" + \frac{3}{8}"$ ;  $-\frac{3}{8}" + 5/16"$ ;  $-5/16" + .069"$ ; and  $-.069"$ . The three largest grades are discharged into open-type bins (No. 15), the separators of which intersect under the final screen. The fine sand ( $-.069"$ ) is sluiced back to the dewaterer.



## "We're 100% DEISTER" Says Midwest Plant Owner

"We've standardized 100% on Deister Vibrating Screens at our new Muncie, Ind., plant," says Mr. F. W. (Jake) Irving . . . and this statement results from 27 years experience with Deister Screens.

Mr. Irving is widely known in the Midwest for his extensive operations in the aggregate industry. He now uses a total of 19 Deister Vibrating Screens and in his newest plant he's using 4 Deister Screens.

The Deister Type UHS Vibrating Screen provides high capacity and peak efficiency through the *exclusive* Opposed Elliptical

Throw principle. It features a Unitized Lifetime Vibrating Mechanism, with oil bath operation . . . also, exclusive Deister adjustable "slope" panels at feed and discharge ends.

These profit-making features and many others are built into Deister Vibrating Screens to give you maximum protection against downtime . . . assure maximum production to rigid specifications.



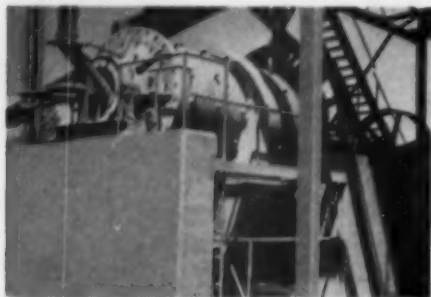
# DEISTER MACHINE COMPANY

1933 EAST WAYNE STREET, FORT WAYNE 4, INDIANA

# MARCY

## SPECIAL CPD MILLS for grinding specification sands

**BETTER SAND PRODUCT**—Grinding in a Marcy CPD Mill produces a uniformly cubical shaped product with same characteristics of shape and strength throughout the range of sizes produced. This results in:



Typical installation of Marcy Center Peripheral Discharge Mill.

- stronger concrete
- better finish on concrete
- better slump characteristics
- use of less cement

**OPERATING ADVANTAGES**—Compared with crushing, experience has proved these additional advantages of grinding by Marcy CPD Mills:

**LOW COST**...low maintenance, less steel consumption and less power per ton result in an overall cost generally less than 25¢ per ton, exclusive of amortization.

### CLEANER OPERATION

**FLEXIBILITY**...by varying rate of feed, pulp dilution and discharge port area it is possible to change gradation of finished product to meet different specifications.

### WET OR DRY GRINDING

Capacities from 2 to 200 dry tons per hour.

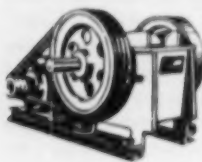
### MASSCO-GRIGSBY RUBBER OR NEOPRENE PINCH VALVES

Designed for abrasive and corrosive pulps. Patented hinged sleeve for longer wear. 1" to 14" diameter. Up to 150 lbs. continuous pressure.



### MARCY PULP DENSITY SCALE

Gives Direct Reading of weight of sample in grams or kilograms; specific gravity of liquid, specific gravity of pulp; percent solids contained in a pulp of any given specific gravity; specific gravity of dry solids. Is very accurate and easy to keep clean.



### LABORATORY EQUIPMENT

#### 4" x 6" MASSCO LABORATORY JAW CRUSHER

Welded steel frame; manganese steel jaw and check plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjustment for plate wear and product size by convenient hand wheel.

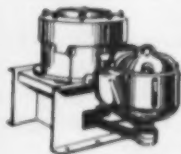
#### MASSCO GY-ROLL REDUCTION LABORATORY CRUSHER

Reduces 1/2" feed to as fine as 10 mesh in single pass. High capacity with low power consumption. 6" and 10" sizes.



#### MASSCO-McCOOL PULVERIZERS

Disc type grinder with planetary movement. No gears. Will grind from 1/4" to 150 mesh in one pass.



# The Mine & Smelter Supply Co.

DENVER • SALT LAKE CITY • EL PASO • NEW YORK

Representatives in Foreign Countries

**WRITE  
FOR  
COMPLETE  
DATA**

## MANUFACTURERS NEWS

**Wheeler Instruments Division**, Barber-Colman Co., Rockford, Ill., has established a branch office in Houston, Texas, with William Thorat as branch manager. Harold S. Hern has joined the sales staff in Baltimore and John C. Twomey has been appointed sales engineer in Boston. New sales engineers in Chicago are Walter A. White and Robert G. Steel. Tom J. Chakos has joined the Chicago sales staff. Service engineers in the Los Angeles office are Henry T. Clinkaberry and Robert D. Getzelman, and Charles E. McGoff has joined the St. Louis office as service engineer.

**Allen-Sherman-Hoff Pump Co.**, Wynnewood, Penn., has elected Wm. B. Stephenson as president of the company, succeeding Homer E. Allen, who has been named chairman of the board. Mr. Stephenson was formerly vice-president and will be succeeded by Fred S. Stow, who will continue as chief engineer, with Gordon Stieff as assistant. Donald G. Ashe has been named assistant sales manager in Wynnewood; Wm. M. Walters, central district sales manager in Chicago, and Robert M. Jensen has been placed in charge of the New York office. Well known as an authority on the pumping of abrasives and corrosives, Mr. Stephenson joined the company upon graduation from Pennsylvania State University, University Park, Penn., in 1933.



Wm. B. Stephenson

**Euclid Division**, General Motors Corp., Cleveland, Ohio, has announced the following appointments. John A. Polhemus, eastern regional manager for eastern Canada, Maine, Vermont, New Hampshire, New York, Massachusetts, Connecticut, Rhode Island, New Jersey, Maryland, Delaware, District of Columbia and eastern Pennsylvania; J. E. Ehlert, manager of the Cleveland district which covers Ohio, Michigan, Indiana and western Pennsylvania; E. C. Dullen, central regional manager for North Dakota, South Dakota, Wyoming, Colorado, Arizona, New Mexico, Oklahoma, Kansas, Nebraska, Iowa, Missouri, Illinois, Wisconsin and Manitoba in Canada; C. B. Pace, manager of the southern region which includes Texas, Arkansas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, Kentucky, West Virginia and Virginia; R. M. Brown, manager of the Hibbing, Minn., branch, which covers Minnesota and the western part of the Upper Peninsula of Michigan; and M. H. Johnson, western regional manager for Utah, Nevada, California, Montana, Idaho, Oregon, Washington, Alaska and western Canada.

**Fulton Bag & Cotton Mills**, New Orleans, La., announces the appointment of W. W. Plumb, Atlanta, Ga., as director of manufacturing of the bag division. J. A. Banda has been named director of export sales; F. C. Sivori, New Orleans, La., director of canvas sales; and H. H. Rogers, Atlanta, Ga., has been placed in charge of industrial engineering.

**The Howe Scale Co.**, Rutland, Vt., has announced the appointment of Jack Bradt as sales manager of the truck division. A graduate of Cornell University in mechanical engineering, Mr. Bradt was formerly doing market research and development work for The Safety Car Heating & Lighting Co., which was acquired by Howe Scale Co. in January of this year.

**Baldwin-Lima-Hamilton Corp.**, Construction Equipment Division, Lima, Ohio, has appointed the following distributors: Mineco, Inc., Bar-

FOR HIGH PRODUCTION AND LOWEST OPERATING COSTS—

**NOTHING** equals the

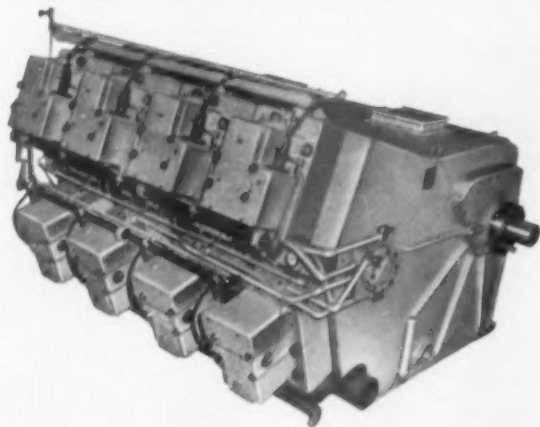
# PAGE 700

SERIES  
SINGLE DECK WALKING DRAGLINE

3 models  
5 to 15 cubic  
yard capacities



**Powered by the  
DRAGLINE-PROVED PAGE  
HORIZONTAL V-TYPE DIESEL**



The Page Engines powering 700 Series Draglines are designed specifically for dragline work . . . to work longer, at lower cost, with less downtime and maintenance than any other engine. Big bearings, big pistons, a short, stiff crankshaft and slow (450 RPM) speed are only part of the story of why many Page Diesels are still producing maximum horsepower after 20 years of operation. Bulletin WDSD-155 has full details.

Page 700 Series Draglines are rugged, compact, work-horse machines. They are designed and built with the fastest practical hoist and swing speed to reduce cycle time and increase yardage.

The Page 700 Series Dragline is proof that a fast, efficient, medium-sized machine will consistently outperform larger, but slower machines in virtually every kind of digging.

In addition, initial investment for a Page 700 Series Walking Dragline is considerably smaller, and operating and maintenance costs are lower. Want more details? Write for Bulletin WDSD-155 today. There's no obligation.

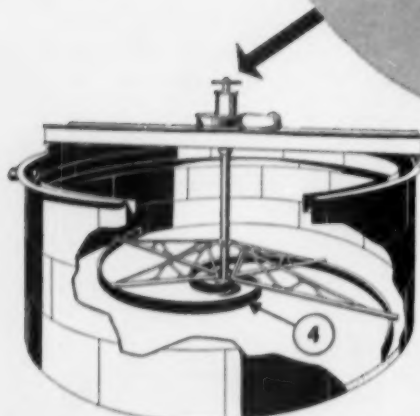
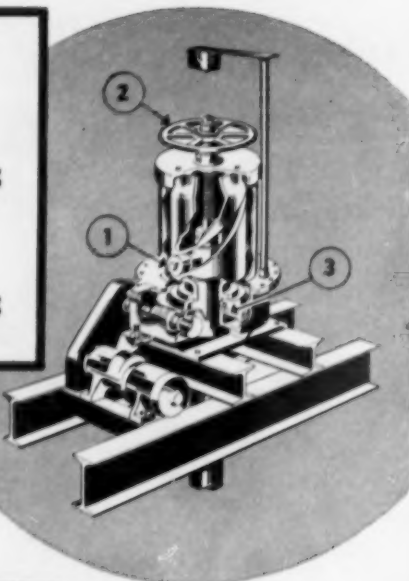
PAGE ENGINEERING COMPANY  
CLEARING P. O. — CHICAGO 38

**Page**  
**Automatic Dragline**  
**Buckets**  
**Walking Draglines**

W-2001

*If it's a PAGE... It DIGS*

# Hardinge THICKENERS and HYDRO- SEPARATORS



... for all  
clarifying,  
thickening and  
de-sliming  
operations.

For flotation concentrates thickening ahead of filtering—or for tailings disposal or reclamation, Hardinge Thickeners provide:

1. "Auto-Raise" to avoid lost production from overloads.
2. Manual or power raise to supplement "Auto-Raise."

3. Replaceable ring-type ball bearing support for rotating mechanism.
4. Spiral rakes for maximum underflow density.

Also available are froth rakes for froth-free overflow and superposed type tank construction for minimum floor space and building economy. Complete specifications on request. Bulletin 31-E-7.

## HARDINGE COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works  
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

tow, Fla., for the central portion of Florida; Southern Equipment Sales, Inc., Jackson, Miss., for the southern half of Mississippi; and Hall-Perry Machinery Co., Butte, Billings and Great Falls, Mont., for Montana with the exception of Lincoln, Mineral and Sanders counties.

**Detroit Diesel Engine Division**, General Motors Corp., Detroit, Mich., announces that E. D. Tull, executive vice-president of the Cummins Engine Co., Inc., has been elected president of the Internal Combustion Engine Institute. He succeeds B. G. Van Zee, chief engineer of Minneapolis Moline Co., who continues as a member of the board of directors.

**H. K. Porter Co., Inc.**, New York, N. Y., announces that Richard M. McKenna has been appointed district sales representative for the Leschen wire rope division in Manhattan, Bronx and all of Long Island, and that Deane Courtwright has been appointed district sales representative for the division in Washington, northern and western Idaho, and Montana.

**Goodyear Tire & Rubber Co.**, Akron, Ohio, has appointed J. W. Smith as eastern sales manager of the industrial products division, replacing O. A. Schilling, who has been promoted to manager of industrial products departments. J. L. Sinclair, manager of the industrial products district office at Cleveland, has been transferred to the Chicago district as manager. R. J. Arlo, district manager at Charlotte, N. C., succeeds Mr. Sinclair as manager at Cleveland. Harper V. Bressler, assistant sales manager of the industrial products division, has retired after 37 years of service.

**Iowa Mfg. Co.**, Cedar Rapids, Iowa, has announced the appointment of Charles H. Kimball as sales representative in Arizona, Colorado, New Mexico, Utah, southwest Texas and southern California, with headquarters in Scottsdale, Ariz.

**General Cable Corp.**, New York, N. Y., has instituted a method of conductor identification of power and control cables with the application of colored synthetic rubber base coatings to the surface of the black neoprene jacketed conductors.

**Smith Engineering Works**, Milwaukee, Wis., has appointed the Manegold Equipment Co., Detroit, Mich., as distributor for eastern Michigan, and Emmett C. Watson Co., Inc., Louisville, Ky., as distributor for Kentucky and southern Indiana.

**The Timken Roller Bearing Co.**, Canton, Ohio, has announced the appointment of H. E. Markley, formerly secretary, as assistant to the president, and George L. Deal, formerly treasurer as secretary and treasurer.

**Hewitt-Robins, Inc.**, Stamford, Conn., announces that Frank W. Blanchard has been appointed to the newly created position of assistant to the executive vice president, Austin Goodyear, in the administration and coordination of the industrial products divisions. He

Have You Seen the **AGIPELLER**?

**NEW!**  
INCREASES  
OUTPUT!  
CUTS  
COSTS!

**THIS SUCTION  
DREDGE AGITATOR** (Pat. Pend.) keeps nozzle clean, loosens compacted deposits, crushes oversized stones. Pays for itself quickly. Write for free bulletin. \*Trade mark

**PFARRER-SCHMIDT ENGINEERING CO., INC.**  
211A W. Wacker Dr. Chicago, Ill.  
Dredge and Pump Engineers



## WOVEN WIRE SCREENS

ACCURATE • DURABLE • ECONOMICAL

The reliability of T.C. Alloy Screens has carried them into all parts of the world. Made in Standard and Special Weaves, with Square or Oblong Openings—from 10 mesh, .035" wire on up. Write today for Catalog No. 53.

**TWIN CITY IRON & WIRE CO.**  
35 W. WATER STREET • ST. PAUL 1, MINNESOTA

## 1105...YES, ELEVEN-O-FIVE

Is the new-strength wire in Roebling's



AS SIZES and constructions go, Royal Blue is like the ropes you have used until now...but the likeness ends there.

Royal Blue is made of Roebling's new 1105 wire, the strongest, toughest wire developed up to now for use in any wire rope.

Royal Blue Wire Rope is as enduring as the wire from which it is made.

Write us for full facts on the all-steel Royal Blue Wire Rope, or contact your Roebling distributor.

### ROEBLING

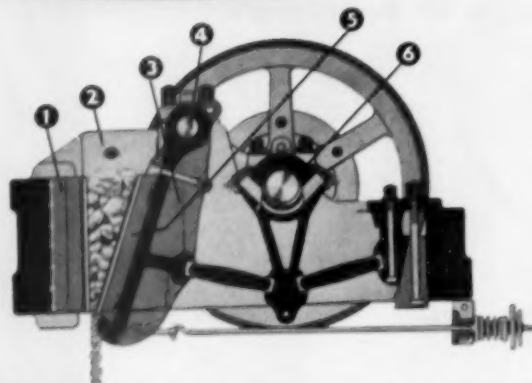
Subsidiary of The Colorado Fuel  
and Iron Corporation



JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5425 W. ROOSEVELT RD. • CINCINNATI, 3252 FREDONIA AVE. • CLEVELAND, 13325 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 916 FISHER BLDG. • HOUSTON, 4216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODessa, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 221 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.



# FARREL-BACON JAW CRUSHERS



## DESIGNED FOR *at least* 50 YEARS OF SEVERE CRUSHING SERVICE

The frame of a Farrel-Bacon jaw crusher is cast in one piece from Meehanite® metal to take the shock of prolonged and severe crushing service. At points of wear this frame is protected by parts which absorb any wear that might occur, and can be easily replaced at minimum cost.

Some of the places at which wear has been "designed out" are: (1) **ROUND BACK**—provides a machined seat for the fixed jaw plate and prevents damage to the main frame. (2) **CHEEK PLATES**—protect frame sides; made in two pieces for economical replacement. (3) **FALSE CHEEK PLATES**—hold cheek plates, and prevent wear on

frame at this point. (4) **SWING JAW SHAFT**—pinned rigid in frame bearing to prevent wear on frame casting.

Many of the working parts are preserved similarly. The swing jaw has a replaceable wearing plate (5), and the main bearings (6) can be easily removed and rebabbitted in the shop.

Farrel-Bacon can help you lay out your plant as well as supply all necessary equipment from primary crusher to bin gate. Write for further details.

### FARREL-BACON

Ansonia, Connecticut

BA-6

was formerly manager of operations of the industrial rubber division, Buffalo, and will be succeeded by A. F. Dantino, production manager, who will be replaced by Robert C. Estes, formerly purchasing agent for the division.

**The Albemarle Paper Mfg. Co.**, Richmond, Va., announces formation of the Raymond Bag Corporation as a division which combines manufacturing facilities of The Raymond Bag Co., Middletown, Ohio, with those of the multiwall bag division of Albemarle. Officers of the new corporation include F. D. Gottwald, chairman of the board; C. L. Mers, president; J. H. Lawrence, vice-president of manufacturing; J. R. Clements, vice-president of sales; W. G. Shaw, treasurer; and C. C. Mers, secretary.

**J. B. Ehrsam & Sons Mfg. Co.**, Enterprise, Kans., has purchased the foundry of Morse-Koob, Inc., Wichita, Kan., which will be operated under the name of Ehrsam Wichita Foundry, Inc. Les Parrish, manager of the foundry division at Enterprise, will also manage the Wichita foundry.

**The W. W. Sly Mfg. Co.**, Cleveland, Ohio has named Allen Jones as director of engineering. He was formerly Chicago district manager and will be succeeded by Harry R. LeSage, who has been serving as eastern Michigan sales manager for Dutton Engineering Co.

**Modern Engineering Co.**, St. Louis, Mo., has announced the appointment of Frank N. Phelps, Jr., as advertising manager of the oxyacetylene welding and cutting apparatus divisions. He has been active in industrial advertising and marketing since 1927.

**Cleaver-Brooks Co.**, Milwaukee, Wis., announces the appointment of Robert E. Sullivan as a supervisor of the sales department handling the sale of commercial heating boilers. He was formerly vice-president in charge of sales for Mt. Hawley Mfg. Co., Peoria, Ill.

**Cere Steel Products Corp.**, Chicago, Ill., has announced the election of C. Foster Brown, Jr., as executive vice-president in charge of production and sales. He has been vice-president and assistant to the president since 1954.

**Eaton Automotive Products Limited**, London, Ont., Canada, subsidiary of Eaton Mfg. Co., Cleveland, Ohio, announces that W. A. Paterson has been appointed vice-president and general manager to succeed Arthur C. Pullen, who has resigned.

**Straub Mfg. Co., Inc.**, Oakland, Calif., has appointed the following distributors: O. S. Stapley Co., Phoenix, Ariz., for Arizona; Union Supply Co., Denver, Colo., for Colorado and New Mexico; and Moss Equipment & Supply Co., Casper, Wyo., for Wyoming.

**Clark Equipment Co.**, Benton Harbor, Mich., has appointed the following distributors: Merts Equipment Co., Albany, Ga., in Georgia counties south of and including Chattahoochee,

## CONTRACT CORE DRILLING

**EXPLORATION FOR MINERAL DEPOSITS**  
INCLUDING URANIUM & LIMESTONE — ANYWHERE

**FOUNDATION TEST BORING**

**GROUT HOLE DRILLING**

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

**JOY MANUFACTURING CO.**  
Contract Core Drill Division  
MICHIGAN CITY, INDIANA

## Slurries...handled at lower cost

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

**A. R. WILFLEY  
and SONS, Inc.**  
Denver, Colo., U.S.A.

New York Office: 1775 Broadway, N.Y.C.

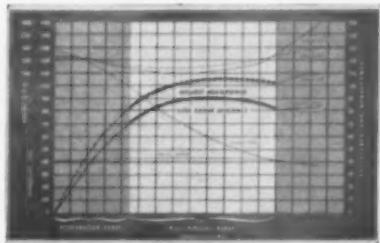


**WILFLEY**  
centrifugal PUMPS

# MORE WORK DONE, LESS MAINTENANCE

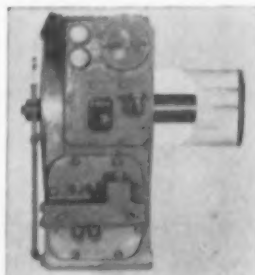
## -these benefits are built in TORCON

### Torque Converters



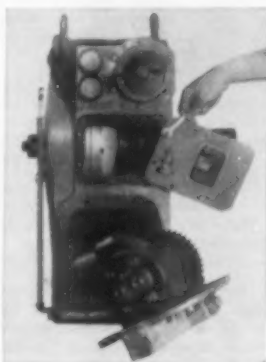
#### \* Engine efficiency and torque demand in constant balance...

Torcon design provides that the engine will operate at its most efficient speed, with torque multiplication to meet constantly changing demands. Torcon blade design eliminates cavitation, assures high efficiency throughout a wide working range.



#### \* Integrated oil system...

Oil pump is an integral part of the housing casting—an important advantage. Internal oil passages are cast in the housing—reducing the number of parts, eliminating unnecessary hoses and fittings, preventing leakages that impair efficiency. Oil flows automatically to lubricate all working parts.



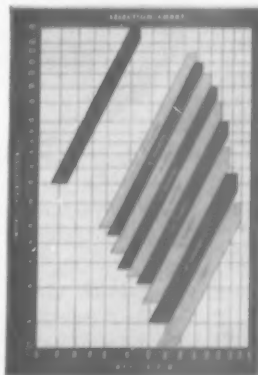
#### \* Easy accessibility...

Ample sized cover plates are easily removable for quick inspection—no special tools required. Regulating valves are mounted on the outside of the housing, for immediate inspection.

#### \* A complete line—15 to 600 HP

Torcon torque converters include mass-produced standard package units available to equipment manufacturers and to owners and operators for field installation.

A broad range of wheel diameters and options assures a unit that can be fitted readily into any power-transmission system.



#### THIS BULLETIN WILL BE HELPFUL

A brief, clear statement of Torcon features—well illustrated. Use the coupon.

CLARK EQUIPMENT COMPANY, Transmission Division  
Falahoe Road, Jackson 10, Michigan

Please send me the Torcon Bulletin

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FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

**CLARK<sup>®</sup>**  
**EQUIPMENT**

**CLARK EQUIPMENT**  
**COMPANY**  
Jackson, Michigan

# lower YOUR COST per foot drilled



**"ORIENTED" DIAMOND CORING BIT**

Available in four different matrices and three different grades of correctly-sized diamonds. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.



**"M" SERIES "ORIENTED" DIAMOND CORING BIT**

For use with "M" SERIES Core Barrel, when good cores must be secured from soft or friable strata. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of impregnated sizes. EX, AX, BX and NX sizes carried in stock.

**"ORIENTED" DIAMOND "TAPER" TYPE NON-CORING BIT**

The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.

## RESETTING SERVICE

Send in your bits that need resetting, giving full details of results obtained and conditions under which the bits were used. Prompt, accurate and dependable service assures you that they will be returned new and with the diamonds "Oriented". Generally, reset bits are on their way back to the customer within three working days. In many cases, suggestions for improvements in bit performance can be made after inspection of your bits, provided full details covering their use have been received.

**SPRAGUE & HENWOOD, Inc.**  
SCRANTON 2, PA.



Branch offices: New York • Philadelphia • Pittsburgh • Buchans, Newfoundland • Grand Junction, Colorado

Marion, Schley, Macon, Dooly, Fulaaki, Dodge, Wheeler, Montgomery, Toombs, Tattnall, Evans, Appling, Pierce, Brantley and Charlton; Mainline Equipment Co., Inc., Des Moines, Iowa, in Iowa counties east of and including Dickinson, Clay, Buena Vista, Sac, Carroll, Audubon, Adair, Union, Ringgold; and west of and including Worth, Cerro-Gordo, Franklin, Hardin, Marshall, Jasper, Marion, Monroe and Appanoose; and R. A. Young & Son, Inc., Fort Smith, Ark., in Arkansas with the exception of the counties of Clay, Green, Craighead, Mississippi, Poinsett, Cross, Crittenden, St. Francis, Lee, Phillips, Chicot, Ashley, Union, Columbia, Lafayette and Miller.

Napco Construction Equipment Division, Napco Industries, Inc., Minneapolis, Minn., has appointed the following distributors: R. B. Wing & Son, Albany, N. Y.; Miller Equipment Co., Grand Rapids, Mich.; Miller Equipment Co. of Detroit, Livonia, Mich.; Powered Equipment Corp., Newton Highlands, Mass.; Knight Equipment Co., Richmond, Va.; Porter Supply Co., Huntington, W. Va.; Industrial Service Co., Inc., Norfolk, Va., and Superior Equipment Co., Phoenix, Ariz.

St. Regis Paper Co., New York, N. Y., announces the appointment of Don R. Russell as sales representative of the multiwall packaging division in the Minneapolis office. He was formerly sales representative in Cincinnati, Ohio.

Challenge Mfg. Co., Los Angeles, Calif., new plant in Bryan, Ohio, for the manufacture of "Facemaker" truck mixers, is now in full production, according to an announcement by J. Ross Gastendyck, president.

Dravo Corp., Pittsburgh, Penn., has announced the appointment of James L. Everett as assistant to the general manager of the engineering works division. He has been with the firm since 1939.

Stephens-Adams Mfg. Co., Standard Products Division, Aurora, Ill., has opened a regional warehouse at 650 Murphy Ave., S.W., Atlanta, Ga., to serve distributors and sales offices in the southeast. Al Steele is sales manager at Atlanta, and Don Dolan holds a similar position in Raleigh, N. C.

The Frank G. Hough Co., Libertyville, Ill., announces the appointment of Ralph E. Zimmerman as district representative of sales district No. 6, covering New York and Pennsylvania but excluding the New York City and Philadelphia areas.

Baker-Raulang Co., Cleveland, Ohio, has appointed W. W. Munroe Co., St. Louis, Mo., as distributor in southern Illinois, eastern Missouri and metropolitan St. Louis.

Harrisburg Steel Corp., Harrisburg, Penn., announces the appointment of Richard Herold as general sales manager in addition to his duties as vice-president of foundry sales of the Taylor-Wharton division, High Bridge, N. J.

Morris Machine Works, Baldwinville, N. Y., announces the appointment of J. E. Kennard, Tampa, Fla., as sales representative in Florida except for the phosphate industry in the central part of the state. J. C. Cary, sales engineer in the Baldwinville office, has been transferred to the New York office.

Borg-Warner Corp., Chicago, Ill., announces the appointment of Spencer H. Mieras as president and general manager of the Warner automotive parts division. He succeeds Ralph Allison who has retired after 45 years of service. Robert G. Hess has been named executive vice-president of the Penco products division. He was formerly vice-president of operations.

Gerlinger Carrier Co., Dallas, Ore., has appointed the following distributors: Florida-Georgia Tractor Co., Jacksonville, Lakeland and North Miami Beach, Fla.; Hart Industrial Supply Co., Oklahoma City, Okla.; Southern

# MORE POWER ~~TO~~<sup>for</sup> YOU!

How the EXTRA POWER in the NEW BAY CITY  
ONE YARD SHOVEL HELPS YOU



260

The *greater power* and greater strength built into the new heavy-duty BAY CITY one yard-shovel results in smoother, faster operation for you. There's *greater power in the engine*: a big 113 H.P. Diesel assures you of the ability to get in and out of tough places, to dig hard materials with ease, and to maintain a fast, smooth digging cycle. *Power steering* through cone clutches which actuate brakes, gives you superior maneuverability: you can make sharp or gradual turns in either direction while the machine is in full

motion . . . you don't have to stop to throw out jaw clutches or set steering brakes. *Power Boom Hoist* on the BAY CITY raises and lowers boom always under power, and the *Power Dipper Trip* makes dumping much easier and much faster. In addition, the BAY CITY has *Power Booster Clutches* which take fatigue out of operating and give you bigger yardage. Put this powerful BAY CITY to work. Get further information today, from your local dealer or write the factory for Bulletin 60B.

BAY CITY SHOVELS INC. • BAY CITY, MICHIGAN

## BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



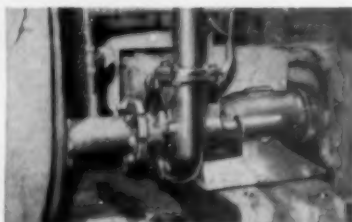


## Nagle Pumps

HANDLE THE GRITTY JOBS FOR  
AMERICAN AGGREGATES CORP.

These NAGLE SAND PUMPS are built from the ground up to handle gritty, heavily loaded liquids. Manganese Steel, ABK Ni-Hard, or High Chromium Alloy water end resists abrasive wear. Readily accessible, stuffing box. Simple slippage seal adjustment. Quick-off end plate to reach impeller. Everything for long service life and minimum maintenance.

Nagle Pumps are used at fifteen plants of American Aggregates Corp., Greenville, Ohio, for transferring sand, drainage and other jobs. Pumps shown are at Oxford, Mich., plant. As one of America's largest producers they are in a position to know pumping costs and what to expect in the way of performance. Send for Catalog 5206—shows the broad line of Nagle vertical shaft and horizontal shaft pumps for every abusive material handling job.



**NAGLE  
PUMPS**

**NAGLE PUMPS, INC.**  
1269 CENTER AVE., CHICAGO HEIGHTS, ILL.



PUMPS FOR ABRASIVE AND CORROSIVE APPLICATIONS

## ROCK PRODUCTS

Has the Largest ABC  
Circulation and Highest  
Renewal Percentage in  
the Non-Metallic Minerals  
Industry.

Equipment Sales Co., Columbia, S. C.; and Ross Equipment & Supply Co., Winnipeg, Canada.

Raybestos-Manhattan, Inc., Passaic, N. J., has announced the appointment of John J. Reheuna as sales engineer in the Western sales district, with headquarters in the Chicago office.

Philadelphia Steel & Iron Corp., Conshohocken, Penn., has been sold to G. J. Keady, president of the Sharples Corp., Philadelphia, who will take over personal direction of the company.

Shea Chemical Corp., Jeffersonville, Ind., has announced the following appointments: E. P. Madsen, senior vice-president; James D. Hogan, vice-president; J. B. Sutcliffe, vice-president; G. C. Taylor, controller; and Vincent H. Shea, Jr., general purchasing officer.

Truck Equipment Co., Inc., Buffalo, N. Y., has announced the appointment of the Roy F. Drake Equipment Co., Sioux Falls, S. D., as distributor in South Dakota.

Pioneer Engineering Works, Inc., Minneapolis, Minn., has appointed WEPCO Equipment Co., Cleveland, Ohio, as distributor in Ohio.

The Prime-Mover Co., Muscatine, Iowa, announces the appointment of Nixon Machinery & Supply Co., Chattanooga and Knoxville, Tenn., as distributor for eastern Tennessee.

Moore Dry Kiln Co., Jacksonville, Fla., announces the death on January 2 of Charles J. Williams, chairman of the board.

Square D Co., Detroit, Mich., and Electric Controller & Mfg. Co., Cleveland, Ohio, have merged and Square D will operate Electric Controller as a separate division. F. W. Magin, chief operating officer of Square D since 1933, has been made chairman of the board, and A. G. Patterson, who has served as president of Electric Controller since 1952, has been named president of Square D.

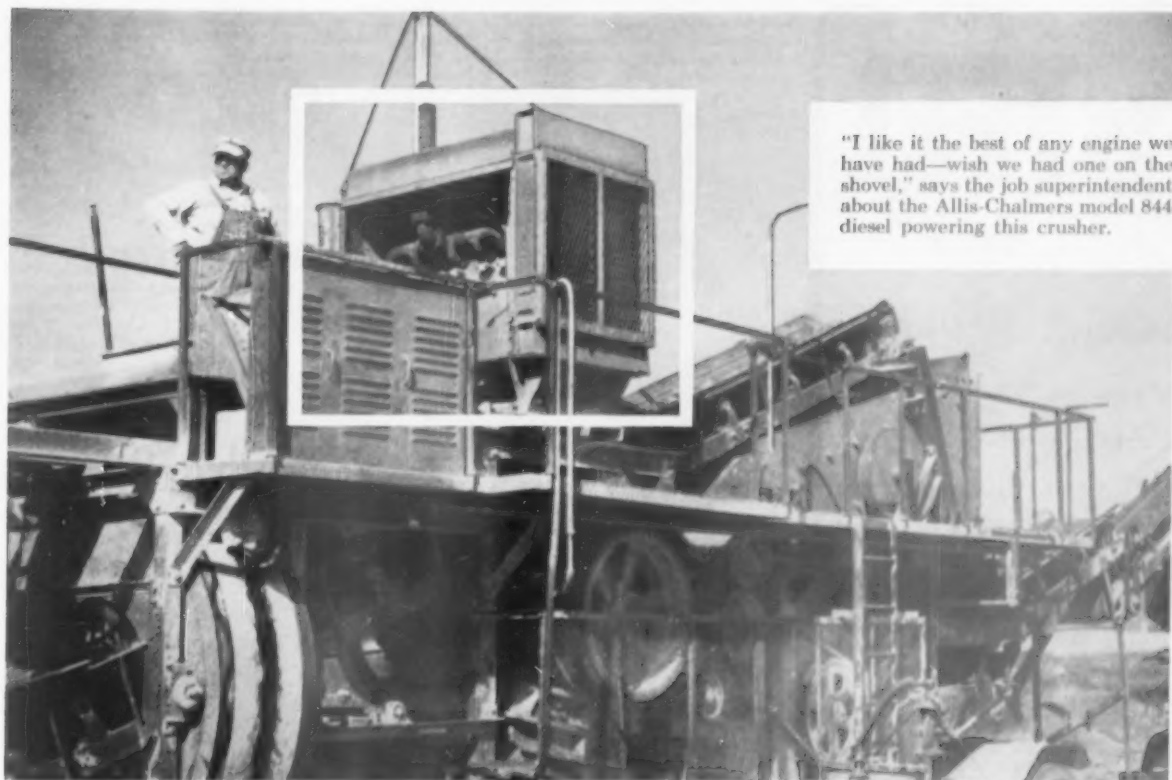
Faller Co., Catasauqua, Penn., has acquired all outstanding stock of the Sutorbilt Corp., Los Angeles, Calif., manufacturer of positive pressure blowers, pneumatic conveyors, fans, material feeders and related products. Sutorbilt will continue to operate as a separate company.

The Thew Shovel Co., Lorain, Ohio, has announced the appointment of Don L. Douglass as parts sales manager for Lorain power shovels and cranes, both domestically and for export, and for the Byers line of shovels and cranes recently acquired by Thew.

A. P. Green Fire Brick Co., Chicago, Ill., announces that Charles W. Glunk has been appointed chief ceramic engineer of A. P. Green Fire Brick Co., Ltd., Toronto, Canada. He was formerly district sales manager in Richmond, Va. Charles C. Morley, controller, has been elected treasurer. He has been associated with the finance division of the company for 28 years.

Macwhythe Co., Kenosha, Wis., has announced the election of Francis D. Holden as vice-president in charge of sales. He was formerly sales manager and has had more than 20 years' experience in the general sales and export division. Goodwin Johnston has been appointed secretary-treasurer. George C. Wilder is president of the company.

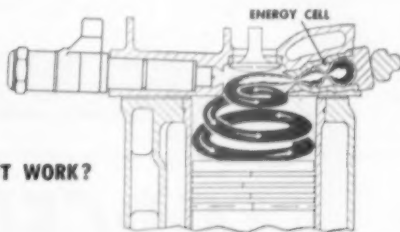
Clark Equipment Co., Benton Harbor, Mich., has appointed Alvin E. York as manager of parts and service, and Alva L. Arend as parts supervisor of the construction machinery division. E. C. Ray Machinery Co., Shreveport, La., has been named distributor in Louisiana parishes of Caddo, Bossier, Webster, Claiborne, DeSoto, Red River and Bienville, and General Equipment, Inc., Baton Rouge, La., in parishes of Sabine, Natchitoches, Grant, LaSalle, Cata-



"I like it the best of any engine we have had—wish we had one on the shovel," says the job superintendent about the Allis-Chalmers model 844 diesel powering this crusher.

## WHAT "Follow-Through" COMBUSTION DOES FOR YOU

"Follow-Through" combustion describes the way fuel burns in an Allis-Chalmers diesel engine. Because of it, more energy is released by combustion into productive power . . . engines last longer.



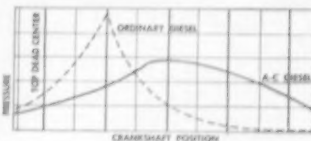
### HOW DOES IT WORK?

Fuel is injected into the combustion chamber and into a special *energy cell*. Combustion starts in the chamber and spreads into the energy cell, where it ignites under tremendous pressure and heat. After a split-second delay, pressure from the energy cell creates a cyclone turbulence in the combustion chamber. This atomizes the fuel and provides a thorough fuel-air mixture. This action produces highly efficient burning, builds up combustion pressure slowly and evenly and retains it longer.

BC-3A

### ADVANTAGES OF "FOLLOW-THROUGH" PRESSURE

This chart compares combustion pressures at different crankshaft positions in Allis-Chalmers and ordinary diesel engines.



In ordinary diesels (dotted line), pressure builds up fast, producing a hammer blow shock load while crankshaft is near dead center.

In the Allis-Chalmers engine, effective pressures are sustained over a longer period when leverage on the crankshaft is more favorable. There is more turning force available for work and it is applied against the crankshaft smoothly.

Result: More sustained power, smoother operation, longer engine life.

"Follow-Through" combustion is just one of many things that are "so good" about Allis-Chalmers diesel engines. You can get the full story from your Allis-Chalmers Buda Division engine dealer.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

## ALLIS-CHALMERS

# STEEL

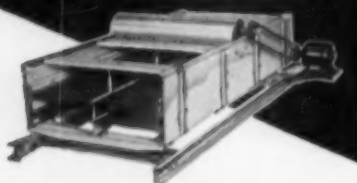
**Every Kind  
Quick Delivery**

**Plates, Structural,  
Bars, Sheets, Tubes, etc.  
Carbon, Alloy, Stainless  
Steels, Babbitt Metal.**

## RYERSON

Joseph T. Ryerson & Son, Inc. Plants at  
New York • Boston • Wallingford, Conn.  
Philadelphia • Charlotte, N.C. • Cincinnati  
Cleveland • Detroit • Pittsburgh • Buffalo  
Chicago • Milwaukee • St. Louis • Los  
Angeles • San Francisco • Spokane  
Seattle.

**UNIVERSAL  
OFFERS THE BEST  
IN VIBRATING SCREENS  
AT THE LOWEST PRICE**



Before you buy, be sure to get a copy  
of the new UNIVERSAL Catalog #150!

There's a model to fit your particular  
requirement, priced within the smallest  
budget.

Write today for free catalog #150!

**UNIVERSAL  
VIBRATING  
SCREEN CO.**

Racine, Wisconsin  
Quality Screens Since 1919

housa, Concordia, Vernon, Rapides, Avoyelles,  
Beauregard, Allen, Evangeline, St. Landry,  
Pointe Coupee, West Feliciana, Calcasieu, Jef-  
ferson Davis, Acadia, Lafayette, St. Martin,  
Iberville, West Baton Rouge, East Baton  
Rouge, Cameron, Vermilion, Iberia and St.  
Mary.

**Euclid Division, General Motors Corp.,** Cleve-  
land, Ohio, has appointed the following dis-  
tributors: J. H. Ryder Machinery Co., Ltd.,  
for the Province of Manitoba, Canada, and  
Baton Rouge Equipment Co., Inc., Baton  
Rouge, La., in southern Louisiana including  
counties south of and including Beauregard,  
Allen, Evangeline, St. Landry, Pointe Coupee,  
West Feliciana, East Feliciana, St. Helena,  
Tangipahoa and Washington.

**Borg-Warner Corp.,** Chicago, Ill., has elected  
Robert S. Ingersoll as president and chief op-  
erating officer. He joined the company in 1939  
and has been administrative vice-president  
since 1963. Roy C. Ingersoll was re-elected  
chairman of the board and chief executive  
officer. Lester G. Porter was named executive  
vice-president; Albert Steg, financial vice-pres-  
ident and treasurer; and Robert W. Murphy,  
vice-chairman of the executive committee in  
addition to his duties as vice-president and  
general counsel.

**Bucyrus-Erie Co.,** South Milwaukee, Wis.,  
has appointed the Schultz Machinery Co., Bis-  
marek, N. D., as distributor in North Dakota,  
and the Baton Rouge Equipment Co., Inc.,  
Baton Rouge, La., as distributor in southern  
Louisiana.

**United States Rubber Co.,** New York, N. Y.,  
has announced that Henry Davis, Jr., formerly  
sales manager in Baltimore, Md., has been  
placed in charge of the Pittsburgh district. He  
is succeeded in Baltimore by Douglas M. Smith,  
formerly a salesman in that area. Robert E.  
Spoerl has been appointed chief sales engineer  
for the conveyor and elevator belting depart-  
ment.

**Joseph T. Ryerson & Son, Inc.,** Chicago, Ill.,  
has appointed Howard A. Stal as manager of  
Tubular steel products and cold finished steel  
bar sales at the Seattle steel service plant. He  
succeeds Loren B. Clay who has been trans-  
ferred to the Los Angeles plant in a similar  
capacity.

**Gardner-Denver Co.,** Quincy, Ill., has moved  
the Los Angeles branch office and warehouse  
to 7654 E. Slauson Ave. W. A. Nilsson is Los  
Angeles district manager.

**Nordberg Mfg. Co.,** Milwaukee, Wis., an-  
nounces the appointment of West Winds, Inc.,  
San Francisco, Calif., as maintenance and re-  
pair facility for users of Symons cone crushers  
in northern California and western Nevada,  
and the Keystone Engineering Co., Los An-  
geles, Calif., in southern California, eastern  
Nevada, Utah, Arizona and New Mexico.

**The Timken Roller Bearing Co.,** Canton,  
Ohio, has announced the appointment of Wyn  
McCoy as sales promotion manager of the in-  
dustrial division. He was formerly Chicago dis-  
trict manager of the division. R. P. Donnell has  
been named district manager of the steel and  
tube division in New York City. He was for-  
merly district manager of the division in  
Cleveland and will be succeeded by Sherman  
R. Lyle. Ross Hershey, formerly sales engineer  
in Detroit, replaces Mr. Lyle as district sales  
manager of the Buffalo district.

**Dravo Corp.,** Pittsburgh, Penn., announces  
that Robert W. Marvin, a director and general  
manager of the engineering works division, has  
been elected a vice-president of the company.  
K. C. Cox has been named a member of the  
board of directors of Dravo of Canada Ltd.  
He has been chief engineer of the company since  
1953.

**You're Sure  
with Merrick**



**FOR Positive Controlled  
Feed by Weight of Sand  
Gravel, Lime Clinker,  
Gypsum or other mater-  
ials to Process—**

Use the Feedweight

**Merrick Scale Mfg. Co.  
Passaic, New Jersey**

**MORE TONNAGE with FORGED STEEL DROP BALLS**

**MORE PROFITABLE, EFFICIENT SECONDARY  
BREAKAGE. WE CAN SHIP IMMEDIATELY.**



2000 to  
12000 lbs.  
WRITE FOR PRICES  
AND INFORMATION

The "Cape Ann" Forged Steel Drop Ball is standard equip-  
ment in up-to-date quarries. It has a forged connecting link,  
protected by deep recess, adaptable for swivel or shackle.  
Strong alloy steel pin. Low cable replacements. Furnished  
complete as shown.

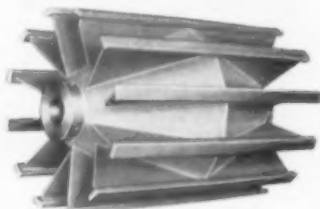
**CAPE ANN ANCHOR & FORGE CO.**  
P. O. BOX 360 GLOUCESTER, MASS.

**FOR GREATER MATERIAL  
HANDLING EFFICIENCY...**

**GREATER PROFIT**

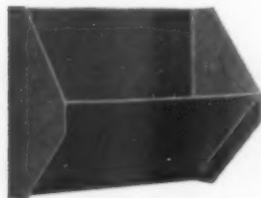
**STANDARD WING TYPE SELF-CLEANING PULLEY**

- SELF CLEANING
- STRONG REINFORCED  
WELDED CONSTRUCTION
- LOW COST



So strong it can withstand the most punishing loads without flinching . . . because its all-steel welded construction gives it far greater strength with less weight at lower cost.

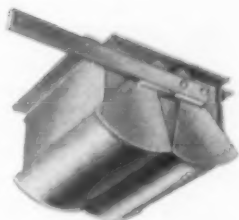
**CONTINUOUS ELEVATOR BUCKET STYLE No. 2**



Built to take the hardest use you can give it and come back for more, this bucket is typical of the complete line of low cost, rugged Standard Steel Buckets — available in Salem, Style "A," shelf type and other continuous style buckets.

**STANDARD BIN GATE**

Speed material handling with this Standard gear-operated bin gate, which has all-steel welded construction. Other styles in Standard Bin Gates also available.



Slash material handling costs by converting to Standard. Write today for catalog showing the complete Standard line.



**STANDARD METAL MFG. CO.**  
110 CENTER ST. MALINTA, OHIO



**REMOVES OVER 90% OF DUST  
RESISTS HEAT AND ACIDS!**



*New collector in operation—over 90% of the dust in stack effluent eliminated.*

**P**roved in use, Southern's new wet type dust collector eliminates 90% of atmospheric dust, while resisting heat and acids.

It all started when we set out to manufacture a light weight aggregate for the building industry. Because of excessive heat, corrosive and abrasive action, we faced a tough atmospheric pollution problem: over 50,000 c.f.m. of reddish brown stack effluent was escaping from six stacks. Many dust collectors—including a commercial wet type—were tried, but none lasted more than a few weeks; none could withstand the heat, acids, and corrosion present. Finally Southern experts solved the problem with an all-new wet type collector that removes approximately 50 tons of dust per day.

If your plant faces a difficult atmospheric pollution problem, it will pay you to get the facts on this new collector. Just contact us. We'll be happy to send a representative, or mail the information desired. No obligation, of course.

**SOUTHERN LIGHTWEIGHT  
AGGREGATE CORPORATION**

**PROCESS ENGINEERING DIVISION, BOX 205 RICHMOND, VA.**

Blaw-Knox Bucket Experts show You HOW TO OBTAIN

## MAXIMUM CABLE LIFE



Users of overhead traveling bucket cranes report amazing cable life increases as a result of applying the practical recommendations, graphically presented with fourteen illustrations of right and wrong bucket applications in Blaw-Knox Bulletin 2510.

This bulletin illustrates and describes proper and improper relationship between:

1. The preferred or required direction of bucket opening.
2. Location and contours of the piles of material.
3. The position of the holding and closing drums in the overhead crane trolley.

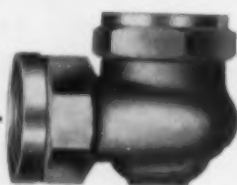
An understanding of this relationship has invariably lead to marked improvement in cable life and bucket performance. Send for your copy of form 2510 today.



**BLAW-KNOX COMPANY**

**BLAW-KNOX EQUIPMENT DIVISION**  
Pittsburgh 38, Pa. • Offices in Principal Cities

SPRAYING SYSTEMS CO.



**SPRAY  
NOZZLES**



for  
lower  
cost  
and  
better  
performance

Modern design. Precision machining. All materials. Thousands of standard industrial spray nozzle types and sizes to choose from. Years of proved experience at your service.

**write for this great  
new catalog today**

Ask for our new 48 page Catalog No. 24 . . . the most comprehensive spray nozzle catalog ever produced. Yours for the asking.

**SPRAYING SYSTEMS CO.**  
3363 Randolph Street • Bellwood, Illinois



**The BIG SWING is to  
AUTO  
VORTEX  
CLASSIFIERS...**

Auto-Vortex Classifiers are doing their jobs so well that operators everywhere just can't help telling their friends about them! About the sharpness of splits they're getting . . . the troublesome middle bulge they're removing . . . the saving of valuable fines that were formerly lost.

Our new sales result almost entirely from this friend-to-friend talk by the **men-on-the-job!** They are causing the current Big Swing to Auto-Vortex Classifiers!

If you have a problem . . . sharpness of splits, middle bulge, or loss of valuable fines . . . Auto-Vortex Classifiers can do the job for you! Write for our Bulletin #81!



**CHARLES E. WOOD COMPANY**

906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN

## BULK MATERIAL CONTROL under Pressure or Vacuum

New Roto-Bin-Dicator mounts outside bin, at any angle, for bin level signaling or machinery control. Material loads on paddle actuate Micro switch in motor housing. Flexible paddle shaft permits use with large or lumpy materials when standard diaphragm indicators are impractical.

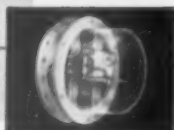


ROTO-  
BIN-  
DICATOR



Low pressure air diffuser assures steady flow of fine, dry materials that tend to pack in storage.

BIN-  
DICATOR  
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AERATOR



The original diaphragm-type bin level indicator for all ordinary applications.

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## CUT TIME AND LABOR COSTS



on "secondary  
breakage"

### with FREDERICK CAST semi-steel DROP BALLS

Eliminate costly, time-consuming drilling or blasting with this low-cost production tool. Rugged, durable Frederick Drop Balls provide you with quick, easy crushing power where you want it—when you want it, with little or no maintenance. Frederick's exclusive "pear-shaped" design withstands greater impact and gives straighter "pin-point" drops. Exclusive "E-Z Swing" steel eye is recessed to prevent excessive ball movement and keep hook in place. Nickel alloy is standard on balls 4000 lbs. or over—or, we'll be glad to quote on special alloys if desired.

Balls can be furnished with replaceable pins, if requested. Special release hooks for free dropping are also available.

Write us today for prices and illustrated literature. Order Balls direct or from your Equipment Dealer.



Wide Range of Sizes and Weights							
Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.).....	470	950	1650	2400	3000	3700	5400
(for magnet use)							

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Phone: MOnticent 3-5111

CENTRIFUGAL PUMPS • MUNICIPAL AND GRAY IRON CASTINGS

## There is only one LIMBEROLLER®

*Limberoller® is the registered trade name for the flexible belt-conveyor idler made exclusively by Joy Manufacturing Company.*



## JOY'S NEW BELT CONVEYOR IDLER

- Cuts Maintenance Costs • Lasts Twelve Times Longer
- Easily Handles Sticky, Corrosive, Abrasive Materials

The *Limberoller* is a new type of belt-conveyor idler that has been setting length-of-life records wherever used. It has already given over *twelve times* the service life of conventional idlers in handling abrasive foundry sands, coal, petroleum coke, potash, copper ores, copper mill tailings, iron ore, wet concrete, triple super-phosphate, ammonium sulphate and sticky fertilizers.

This radical, new idler consists of pressure-molded neoprene or rubber discs on a flexible steel cable. Only two bearings are used and these are up out of the dirt zone.

The *Limberoller* is unaffected by most corrosives that damage steel... is ideal for chemical, sulphur and salt plants.

Get details from *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Write for FREE Bulletin 99-27

WSW 16142A-99



Consult a Joy  
Engineer

# JOY

SINCE 1851... OVER 100 YEARS OF  
ENGINEERING LEADERSHIP

For Air and Gas Compressors, Oxygen and Nitrogen Generators, Vacuum Pumps and Boosters, Conveyors, Fans, Electrical Connectors, Hydraulic Fittings and Hose Assemblies.

## TURNING POINTS—



Wherever conveyor belts turn over, industry turns to the American Pulley Company. From pit or mine to crushing... to processing... in and out of storage... a high portion of recent installations are equipped with American Conveyor Pulleys.

Engineers and operators know they will get pulleys:

**ACCURATELY CROWNED** for true belt tracking.

**EQUIPPED** with the exclusive Wedg-Tite® split tapered hubs to prevent walking on the shaft... the only hubs designed specially for conveyor pulley service.

**DESIGNED** on theory, checked by independent research and proven in thousands of tough applications.

**AVAILABLE** with unique Gripex Spiralagging to eliminate slippage and prolong rim life... renewable with the pulley in place.

**BUILT TO LAST...** by controlled precision methods... by pulley specialists with over sixty years of experience.

When you install new conveyors or modernize existing ones, turn to American for Conveyor Pulleys—Built for the Belt... over 400 standard sizes.

**STOCKED AND SOLD BY DISTRIBUTORS  
IN PRINCIPAL CITIES**

*The American Pulley Company*  
4212 WISSAHICKON AVENUE  
PHILADELPHIA 29, PA.

## HETHERINGTON & BERNER



## DREDGING PUMPS

performance-proven on the toughest jobs

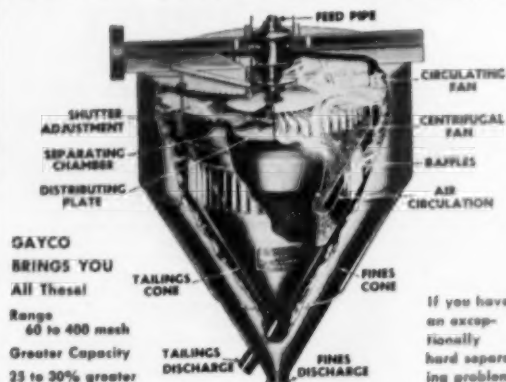


Hetherington & Berner sand and gravel pumps are available in two general types: **STANDARD**, (4", 6" and 8" sizes) with semi-steel parts, for ordinary working conditions and moderate heads; and **DREADNAUGHT**, (6", 8", 10", 12" and 15" sizes) with manganese steel parts, for heavy duty jobs with stringent head conditions.

Write for Bulletin DP-147.

**HETHERINGTON & BERNER INC.**  
755 Kentucky Ave. Indianapolis 7, Indiana

## GAYCO CENTRIFUGAL SEPARATORS



**GAYCO  
BRINGS YOU  
All These!**

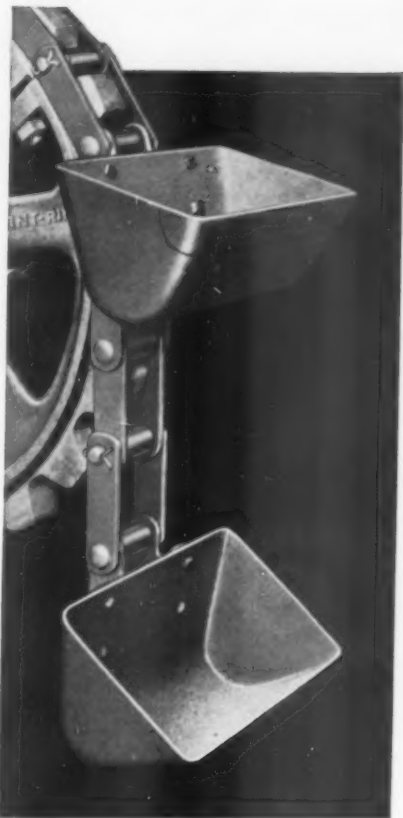
- Range 60 to 400 mesh
- Greater Capacity 25 to 30% greater production
- Cleaner Tailings
- Uniform Products
- Slow speed for slow wear
- Quick and easy adjustments
- "TIMKEN BEARING EQUIPPED"

If you have an exceptionally hard separating problem,  
**TRY THE  
GAYCO.**

Closer separations are possible with the Exclusive Gayco Centrifugal sizing fan. Higher production results from a more complete removal of the fines made by the mill. The efficient Gayco sizing eliminates all undesirable oversize from the product.

**UNIVERSAL ROAD MACHINERY CO.**

Robert M. Gay-Division  
Factory and Laboratory, Kingston, N. Y.  
117 LIBERTY STREET NEW YORK 6, N. Y.  
Canadian Representative: Watson Jack-Hopkins Limited  
8500 Decarie Blvd., Montreal, Que.



## Why LINK-BELT Cast Buckets resist distortion and wear

- \* **Smooth** for easy discharge
- \* **Uniform** to eliminate weak spots
- \* **Reinforced** to strengthen points of greatest stress

LINK-BELT cast buckets are made of the highest grade malleable iron for toughness. Smooth surfaces and well-rounded corners assure smooth, clean discharge.

Besides serving you longer, Link-Belt cast buckets increase your elevator's efficiency. They're properly proportioned for fast filling and quick dumping.

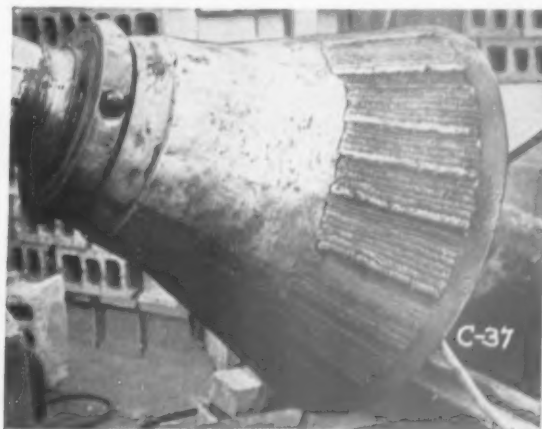
Six styles of Link-Belt cast buckets—as well as a complete line of steel buckets—are available in a full range of sizes. The ideal combination for your bucket elevators is Link-Belt chains, wheels and buckets. Call the Link-Belt sales office or authorized stock-carrying distributor near you for complete facts and selection data found in Catalog 950.

14,000

# LINK-BELT

CAST ELEVATOR BUCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.



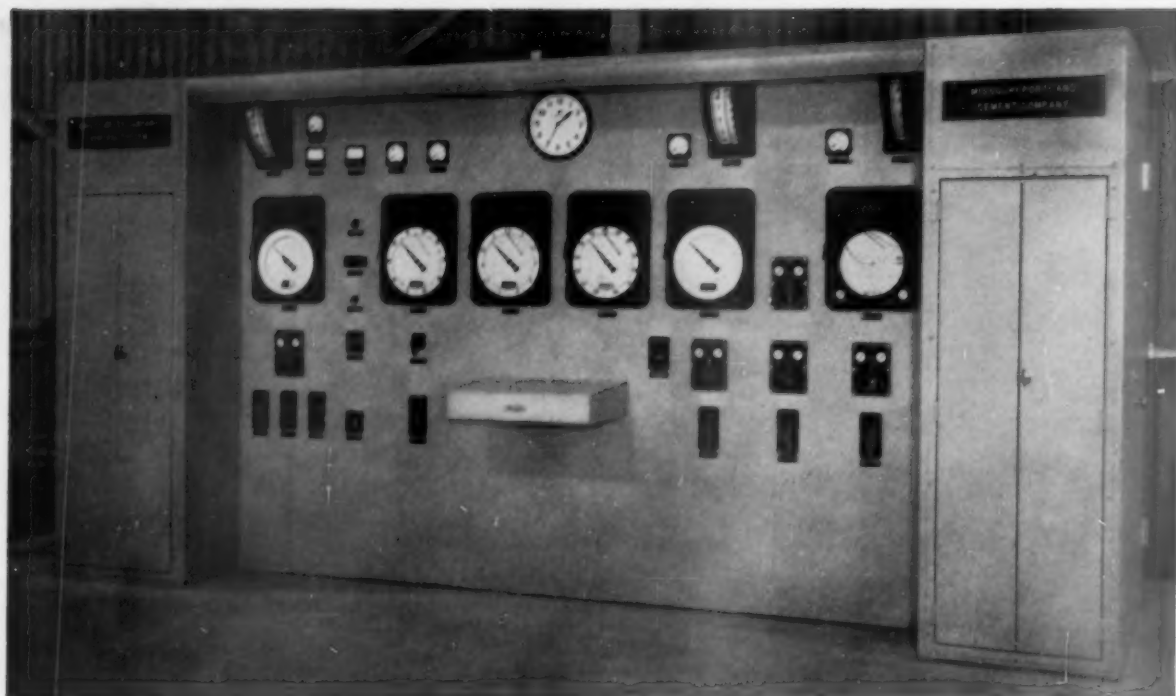
### Before and After Applying MANGA-TONE N.M. and RESISTO-LOY

This rebuilding job on Gyratory Liners was accomplished economically despite the fact that well over an inch of deposited metal was required all around the bottom third. Note the very badly worn areas in the "before" picture. Then note the perfectly done, finished job.

This rebuilding was done by the plant maintenance welder, using our Manga-tone N.M. to rebuild the liner and making the last pass over the lower 15 inches with Resisto-Loy. This final coating pays a fine dividend in additional wear resistance.

Why not put in a call for our field man? He can show you many ways to save materials and money.

**THE RESISTO-LOY CO., INC. - Grand Rapids 7, Michigan**



Main Panel Board for control of 3000 bbl per day Kiln  
at Missouri Portland Cement Company, St. Louis, Missouri.

*3 Ways  
Better*

# ...Bailey Control for Rotary Kilns

Bailey Control for Rotary Kilns gives you better performance three ways:

1. Economical Operation
2. Uniform Quality of Product
3. Reduced Maintenance

These are advantages which can be achieved when all phases of kiln operation are coordinated to work together as a team. Here's how Bailey Kiln Control can help you get all three.

## ECONOMICAL OPERATION

With Bailey Combustion Control you can be certain that you are getting maximum product for every unit of fuel you burn. Bailey Control closely guards the Fuel-Air Ratio, Hood Draft, Fuel Feed, Clinker Cooling and the Temperature of Air for Combustion.

## UNIFORM QUALITY OF PRODUCT

Bailey Instruments and Controls can help you achieve a

uniform high grade product. Measurements of temperatures, kiln speed, combustibles content, and oxygen content can be transmitted to recorders on centrally located control boards like the one shown. There is no sacrifice of accuracy or speed of response. High temperature alarm contacts may also be provided with Bailey Pyrometers as a further aid in achieving optimum uniformity of product.

## REDUCED MAINTENANCE

By maintaining uniform temperatures and excess air conditions in the kiln, Bailey Controls help to reduce to a minimum costly refractory repairs and wear and tear on auxiliary equipment.

Bailey Meter Company has a staff of engineers who are experts in the control of rotary kilns. Assure yourself of optimum kiln performance. Let one of these men help plan your Kiln Control System.

P-22

# BAILEY METER COMPANY

1051 IVANHOE ROAD

CLEVELAND 10, OHIO

*Controls for Processing*

TEMPERATURE  
PRESSURE  
% OXYGEN  
% COMBUSTION

FLOW  
LEVEL  
DENSITY  
RATIO

# CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE



Modern office and ready mix plant of Andersen Sand and Gravel Co., Saginaw Mich.



CONCRETE PRODUCTS made with Atlas Duraplastic cement in solar heated curing house at Kubach Concrete & Cinder Block Plant, Islip, N. Y.

## "Now we get better block—with less breakage"

"We've increased our production, and reduced costly breakage, by making our block with Atlas Duraplastic® cement," says William Kubach, owner of Kubach Concrete & Cinder Block Plant, Islip, New York.

Mr. Kubach is one of many concrete product manufacturers who use Atlas Duraplastic air-entraining portland cement to give better-looking, better-selling block. That's because Duraplastic-made mixes help give block clean, true edges, more uniform dimensions, and the desired face texture. The results are greater sales appeal and greater

satisfaction from customers. Yet Duraplastic provides these advantages at no extra cost... requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For free descriptive booklet, write:

### UNIVERSAL ATLAS CEMENT COMPANY

UNITED STATES STEEL CORPORATION SUBSIDIARY

100 PARK AVENUE, NEW YORK 17, N. Y.

Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee  
Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

\*"DURAPLASTIC" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

AIR-ENTRAINING PORTLAND

# Atlas® Duraplastic Cement

MAKES SUPERIOR CONCRETE PRODUCTS AT NO EXTRA COST

United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.

# INDUSTRY NEWS

## Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER is a view of the Andersen Sand and Gravel Company's modern office building with the new high capacity ready-mixed concrete plant in the background. The 150-cu. yd. per hr. ready-mixed concrete plant was built to keep in step with demands from the construction boom in Saginaw, Mich. In addition to these structures, the company erected a large machine shop and garage, and a building supply warehouse and store which is operated by a subsidiary company. The total cost of the building program was over \$500,000.

## Consolidate Concrete Firms

MO-CON, INC., a recently formed central Missouri corporation, has been announced by Lon C. Ware, Jr., president, Mexico Building Products Co., Mexico, Mo., one of the incorporators. The company unites the management functions of eight concrete plants: Mexico Building Products Co., Mexico; Wentzville Concrete Co., Wentzville; Economy Ready Mix Co., Wright City and Warrentown; Montgomery Block Co., Montgomery City; Vandalia Concrete Co., Vandalia; Callaway Concrete Co., Fulton; and a new plant to be built at Centralia, all of Missouri.

Lon C. Ware, Jr., Mexico; Henry C. Goellner, Wentzville; Jack B. Riggle, Wright City; and William B. Smith, Montgomery City, are the four directors who signed the articles of incorporation. James H. Ware of Fulton is also a director; other directors are to be named.

Production and sales operations continue with the same personnel in each plant. Each of the individual plants were renamed Mo-Con, Inc., of Mexi-

co, Wentzville, etc. The incorporation provides for a stock issue of 50,000 shares at a par value of \$5, the initial issue being 100 shares. The home office of the corporation is at 500 E. Railroad St., Mexico, Mo.

## Concrete Block Contest

THE CONCRETE PRODUCTS ASSOCIATION OF WASHINGTON recently awarded top honors to Graystone of Olympia, Inc. and Bellingham Builders Supply for the companies' heavy and lightweight concrete block, submitted in a recent contest sponsored by the association. Standard 8- x 8- x 16-in. units were submitted to a panel of three judges, and ten division and subdivisions were used in judging the tailoring of the masonry units. In the division of dimensional tolerance, each unit was checked for height, width and length; and in symmetry, square corners, centering of core holes, and solid webs were evaluated. Points were also awarded for consistency of texture, over-all appearance, sharpness of detail, and uniformity of color.

## Opens Second Plant

RED-E-CRETE, INC., has started operations at its recently built dry-mix concrete plant in National City, Calif., a suburb of San Diego. The plant serves the San Diego, Calif., area, Imperial County, and Mexico. It is designed to produce 1,000,000 sacks of Red-E-Crete annually, and has 3000 sq. ft. of warehouse space. Plant facilities include 400,000 lb. capacity storage silos and electronically controlled mixing equipment. The plant is the second operated by the company in Southern California. The other is located in Glendale. B. W. Burges is manager of the new plant in National City.

TRANSMIX CONCRETE AND MATERIAL CO. was purchased by Bill Williamson, Fred Neslage and George Scott, all of Pampa, Texas, and Alfred G. Johnson of Plainview, Texas, from Mrs. Luther Pierson. Joe Sears has been named manager of the Transmix company. No other personnel changes are being made.

HUBER CONSTRUCTION COMPANY has opened a portable ready-mixed concrete plant at the Wayne township site of a 1800-home residential development in Ohio. Six trucks have been purchased to service the plant, which will be used in future years at the site of other construction projects.

WAMIX, INC., Dallas, Texas, has announced the opening of two ready-mixed concrete plants, one in Carrollton, Texas, costing \$130,000, and an automatic mobile plant at Dallas, Texas. The two plants make a total of six operated by the company, with a seventh plant planned for the Pleasant Grove, Texas, area. Earl Turner is manager of the Carrollton plant.

CHARLES A. SMITH CONCRETE CONSTRUCTION CO., St. Matthews, Ky., has been incorporated to deal in concrete products, with an authorized capitalization of 1000 shares, no par. Incorporators are Charles A. Smith and Jessie R. Smith of Prospect, Ky., and Edward L. Ellis, Louisville, Ky.

NEVADA READY MIX COMPANY has opened a concrete products plant at Nevada, Iowa, owned by Glen Hankins and Morton Hess. Specializing in ready-mixed concrete, the company operates a fleet of three 3-cu. yd. transit mixers.

SPOONER CONCRETE PRODUCTS, INC., has been formed in Spooner, Wis., with an authorized capital stock of 500 shares of common at par value of \$100 per share. Incorporation papers were signed by Gilbert Durand of Spooner.

TRI-STATE STONE CO., INC., Salt Lake City, Utah, has been incorporated as a building material and construction business, with an authorized capitalization of \$10,000. Sydney M. Berry is president, W. G. Mors, vice-president, and George Fujino, secretary-treasurer.

WESTERN CONCRETE CO., Santa Ana, Calif., has opened a ready-mixed concrete plant, costing about \$150,000. The plant, sixth operation of its kind owned by the company, utilizes from 30 to 35 trucks.

THE ENGELN CONCRETE CO., has been formed by Ted Engelen at Springfield, Minn., to produce ready-mixed concrete for sale to contractors and area farmers.



Dry-Mix concrete plant, opened by Red-E-Crete, Inc. at National City, Calif.

## Every feature makes for payload



### **SHORTEST CENTER OF GRAVITY**

Example: Jaeger 5½ yd. with rated load has c/g of 69", versus up to 77" in others.

### **3-SPEED TRANSMISSION**

1½ to 16 drum rpm @ 800 to 2000 engine rpm.

### **LIGHT WEIGHT**

Ruggedly built Jaeger 5½ yd. model weighs only 7200 lbs. Average of 10 other makes, including "lightweights", 7129 lbs.

### **FASTEST CHARGING AND DISCHARGING**

16 rpm drum, enlarged loader throat and 25% larger discharge blades set new rates of speed.

### **MORE RUGGED THAN EVER**

Examples: Trunnion and final reduction mounted in same unit; one-piece drum track; largest diameter drum rollers and drive sprocket.

## in the great new Jaeger Model "D"



### COMPLETE OPTIONAL CHOICES

Separate engine or cab-controlled truck engine drive, with type of transmission, loading, water measuring and injection you prefer.

### YOUR JAEGER DISTRIBUTOR

knows your local conditions and how Jaeger mixers can be equipped for most efficient operation with your set-up. Check with him or write us for complete information.

### THE JAEGER MACHINE COMPANY

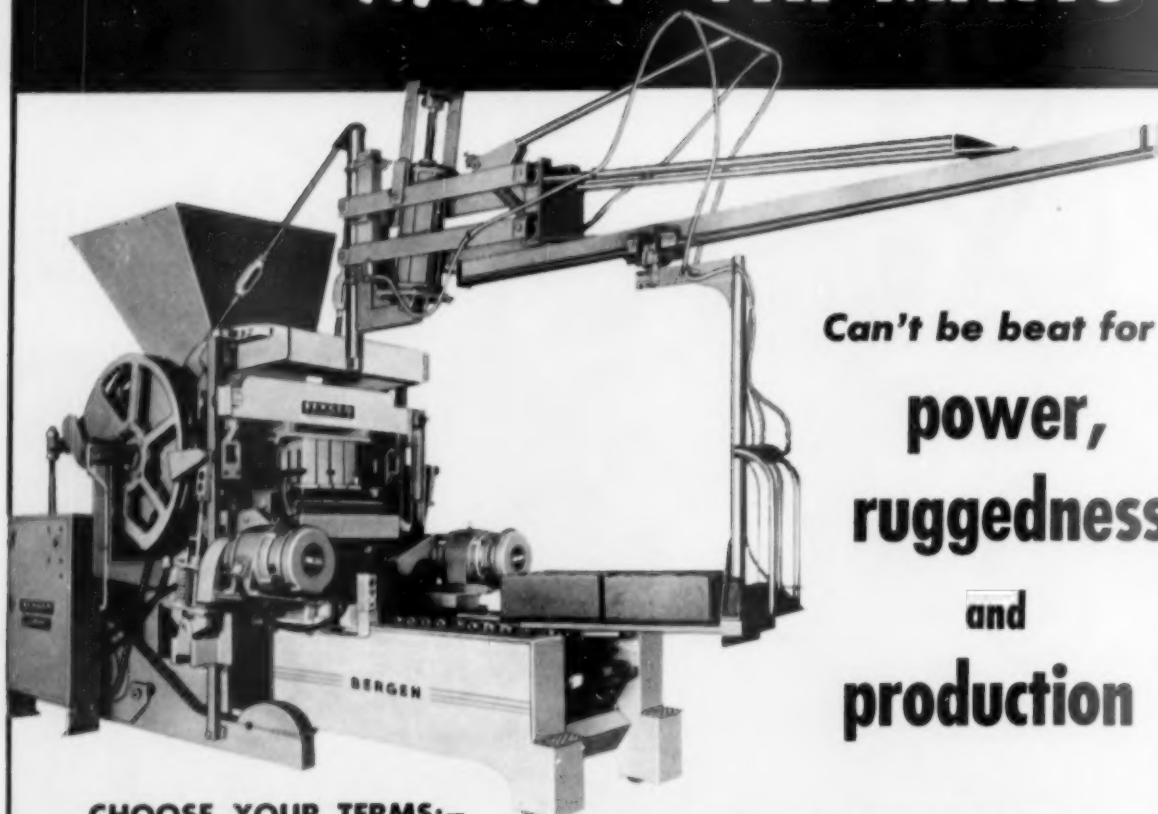
603 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • PUMPS  
CONCRETE MIXERS • PAVING MACHINES



CONCRETE PRODUCTS, June, 1956  
A Section of ROCK PRODUCTS

# **NO BETTER Block Machine than a TRI-MATIC**



**Can't be beat for  
power,  
ruggedness  
and  
production**

## **CHOOSE YOUR TERMS:-**

- 1. CASH**
- 2. TIME PAYMENTS**
- 3. "LEASE-WITH-OPTION-TO-BUY" CONTRACT**

(NON-ROYALTY, FIXED MONTHLY PAYMENT)

**BERGEN**  
MACHINE & TOOL CO., INC.

No block machine on the market today exceeds the TRI-MATIC for the essential features of heavy-duty construction, designed for and producing the finest block at maximum speed.

If you want high production, Tri-Matic is designed to run without strain at rates up to 6 mold cycles per minute, yielding an average of 10,000 — 8" equivalent units per typical 10 hour day. If you want power and ruggedness, just check the size of all motors, shafts, pulleys, etc. . . . AND — not one ounce of quality workmanship or material is sacrificed ANYWHERE on a TRI-MATIC.

Compare a TRI-MATIC WITH ANY MACHINE ON THE MARKET—you'll see why the BERGEN TRI-MATIC can't be beat!

**NUTLEY, NEW JERSEY**

Cable Address: "BERGENCO" (Nutley, N. J.)

## PROFIT TAKING!

RINSON Fork Trucks are designed to pay their own way by reducing time and labor costs. And they do! It takes performance to build reputation . . . that's why RINSON is acknowledged as a pace-setter in the materials handling business. RINSON Fork Lifts incorporate every needed feature for maximum efficiency and versatility in construction materials handling.

Prices start as low as \$3550.

## You Can Take It With You IF IT'S A RINSON FORK TRUCK



RINSON offers big-lift capacity with little-truck maneuverability. Even on tricky ramps or in tight quarters, RINSON trucks are easy to handle and comfortable to operate. Semi-rigid framing gives unbeatable performance over curbs and obstacles . . . without loss of wheel traction. NF 40 and 60 models are equipped with 4-wheel brakes and interchangeable wheels.



There are five standard "towable" RINSON models, each specially and ruggedly built to serve today's requirements for heavy construction materials handling. Custom engineered models and four-wheel-drive trucks can be built to order.

### BIG NEW FEATURES MEAN BIG NEW SAVINGS

**You can take it with you . . .** if it's a RINSON Fork Lift Truck! Just hook up with the built-in towing attachment. In less than five minutes you're ready to roll. You cruise easily at highway truck speeds. RINSON'S steering axle, fold-away forks, tie-in braking and lights are all designed for compactness and safety on almost any road.

**Rinson saves costly man hours . . .** A few minutes after you arrive at the job site your RINSON is ready for a real day's work. And boy . . . what a giant-sized handling job it will do . . . loading, unloading, maneuvering and elevating jobs that would normally require five to eight times as many man hours.

**Inside or out . . .** At your plant or any location, RINSON offers features of versatility and dependability that cannot be matched anywhere. Equally at ease on paved surfaces or rough ground, your RINSON is truly a "trucker's truck" . . . designed and built by men who know the problems of construction materials handling.

**Low cost operation and maintenance . . .** It's built right in your RINSON. All standard towing models employ Ford Truck parts throughout. This marriage of easily obtainable parts to your new RINSON is just another of the many reasons why masonry contractors and materials-handling men in block yards and concrete plants everywhere are recommending that you . . .

## TEST RINSON . . . YOU'LL BUY RINSON

RINSON IS THE ORIGINAL TOWABLE FORK TRUCK

# RINSON

FORK LIFT TRUCKS



C. Rinkin & H. Olson, Rinson Fork Lift Trucks  
725 E. Huntington Drive, Monrovia 2, Calif.

Send free illustrated brochure on RINSON Fork Lift Trucks.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

# WESTINGHOUSE Transit Mixers

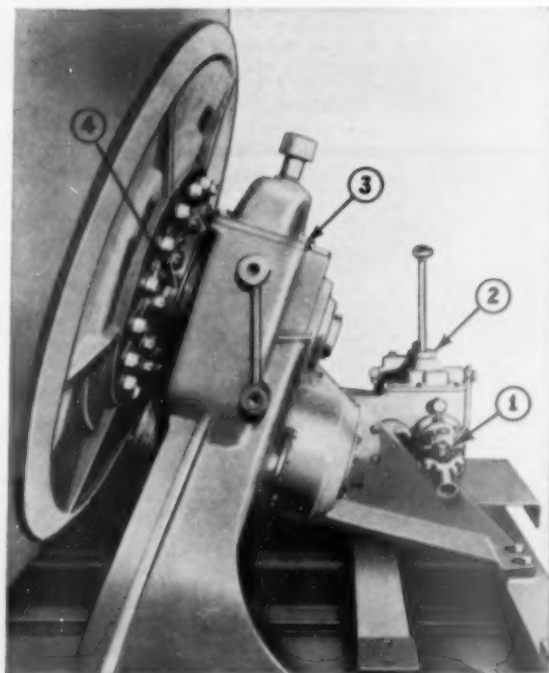


## Have the Most Efficient Drum Drive Mechanism

• No other mixer has a drum drive which is as positive, sturdy and trouble-free as Westinghouse and yet affords complete flexibility. Follow the drive from engine to drum in the illustration at right:

1. A strong universal joint takes the engine power to the transmission eliminating possible strains due to frame flexing.
2. Two-speed transmission (standard on all models) permits wide range of drum revolutions, from 2 to 11 r.p.m., within engine's most efficient operating range—600 to 1700 r.p.m.
3. Drum is driven by fully-enclosed gear drive—an exclusive patented feature. No chains or exposed gears to wear out and replace. Requires little attention and maintenance.
4. Drum has large ball-and-socket mounting at the drum—an exclusive feature. The only mounting which does not transmit misalignment to driving parts due to flexing of truck and mixer frames in traveling over uneven surfaces.

Westinghouse mixers are available in 5 sizes—4½ to 6½ yd. They have other important features you'll like. Before buying another mixer write for descriptive literature to



WESTINGHOUSE TRANSIT MIXER DIVISION  
LeTourneau-Westinghouse Co.  
INDIANAPOLIS • INDIANA

# "RCA RADIO REDUCED OUR OVERTIME 20-30% PER MONTH"



(Above) Mr. Clarence Goetz, Vice-President, Clifton Concrete & Supply Co. and (below) one of the radio-equipped Clifton trucks.



—Reports **CLARENCE GOETZ**

Clifton Concrete & Supply Co.

Cleveland, Ohio

*"It's the greatest thing that has happened to the industry since the advent of the high-dump mixer truck! RCA Radio has reduced our overtime anywhere from 20 to 30 per cent per month. We've made extra profits by being able to close our plant earlier at night."*

And he continues:

- ★ Greater volume of production is possible. Ten trucks, radio-equipped, are equal to 11 trucks.
- ★ Efficiency in dispatching trucks makes entire operation more efficient. Drivers are supervised at all times, reducing unnecessary trips and delays.
- ★ Drivers like 2-Way Radio. It relieves them of responsibility—they get answers to questions immediately without having to stop to telephone.
- ★ RCA 2-Way Radio assures much better service. It not only makes money for us—it makes money for our customers.

## Why are the leaders choosing RCA 2-way Radio?

Most of them say they are impressed by RCA's fine service organization and the years of RCA leadership in radio and electronics. Look for these marks of quality: Superior crystals, tubes and microphones for clearer talking, longer life . . . heavy gauge steel case for rugged service . . . color-coded tuning for simplest maintenance . . . expert service by RCA Service Company to assure peak performance.



Get the whole story—Mail Coupon



**RADIO CORPORATION  
of AMERICA**

COMMUNICATIONS PRODUCTS  
CAMDEN, N. J.

Radio Corporation of America, Communications Products, Dept. F-289, Bldg. 15-1, Camden, N. J. In Canada: RCA VICTOR Company Limited, Montreal.

- ☐ Please send me complete information on the use of 2-Way Radio in my business.
- ☐ Have RCA Communications Specialist make a free RADIO SURVEY of my business.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

# HAUL 6½ YDS. WITHIN

**Low-weight chassis design of  
New Reo F-506M guarantees it!**

**POWERED BY REO'S OWN OH 160  
GOLD COMET ENGINE—GAS OR LPG...  
BACKED BY REO'S OWN 100,000 MILE  
OR 1-YEAR ENGINE WARRANTY!**



The certified chassis weight of Reo's new F-506M is 11,240 lbs. The official weighmaster's receipt proves how it can haul 6½ yds. of concrete and stay well within legal limits. The new Reo F-506M is designed and built specifically for mixer use. Its increased payload is made possible by Reo's new high-strength, low-weight double-side-rail frame construction.

The new Reo F-506M actually hauls up to 2 yards more than the average mixer chassis. And it places as much as 6,000 pounds more on the front axle than other conventional mixer trucks.

Reo full power steering, which is standard, makes maneuvering easy in tight places anywhere.

The new F-506M is powered by Reo's own 160 hp short-stroke, wet-sleeve Gold Comet Engine. Plenty of power for both truck and mixer. And, it's backed by

Reo's famous 100,000 mile or one year warranty.

Reo's exclusive front-axle-payload design places more weight forward—giving you an extra 2 cubic yards of concrete every trip. With it, you can haul your regular daily volume with fewer trucks and drivers . . . or increase volume without increasing your fleet.

For states that permit greater axle loadings than 32,000 lbs., Reo builds the F-536M—52,000 lbs. G.V.W.

Additional hundreds of pounds can be added to the carrying capacity of the new Reo F-506M with Reo's optional front-end power take-off. The PTO also eliminates extra fuel and maintenance costs of the mixer's auxiliary power unit.

Call your Reo branch or distributor today and get the facts on the Reo that's right for you. Mail the coupon for full information.

# 32,000 lb. TANDEM LIMIT



32,000 LBS.

# REO

**REO MOTORS, INC.**  
LANSING 20, MICHIGAN

SUBSIDIARY OF **BOHN** ALUMINUM AND BRASS CORPORATION

Please send at once:

☐ Complete Specifications on F-506M. ☐ Reo Front-End Power Take-off. ☐ New Tandem Catalog.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
TITLE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ COUNTY \_\_\_\_\_ STATE \_\_\_\_\_



# Housing Milestone

## Precast 'Incor' Concrete Framing Cuts Erection Time and Cost on Big Philadelphia Housing Project

● Philadelphia, City of Homes, writes a bright, new page in the record of low-rent housing progress by providing comfortable, fire-safe dwellings for 412 families in its 500,000-sq.-ft. Liddonfield Housing Project, at a cost of less than \$8. per sq. ft. of floor area.

Use of precast 'Incor' concrete columns, floors and roof decks for the 52 two-story buildings made possible assembly line speed in erecting the 20-ft.-wide units, ranging in length from 150 to 200 ft., at the rate of two a week.

All units were fabricated with 'Incor' 24-Hour



Cement for fast, economical production and erection. You know what 'Incor'\* will do . . . always dependable high early strength fits into well-scheduled, assembly-line production, assuring maximum output from the form investment . . . smooth-working mixes speed placing, improve appearance . . . sound reasons for insisting on America's FIRST high early strength portland cement. \*Reg. U. S. Pat. Off.



First step is erection of two-story columns and spandrels. Next, 3-ft.-wide precast floor channel slabs are placed across building's full width. Right, under side of floor—smooth concrete surfaces only require painting.

### PHILADELPHIA HOUSING AUTHORITY LIDDONFIELD HOUSING PROJECT

Architects:  
LIDDONFIELD ARCHITECTS OF  
PHILADELPHIA

Civil Engineers:  
BARTON & MARTIN  
Philadelphia

General Contractor:  
STOFFLET & TILLOTSON  
Philadelphia

Precast Members Made and Erected by  
FORMIGLI CORPORATION  
Berlin, N. J. • Philadelphia, Pa.

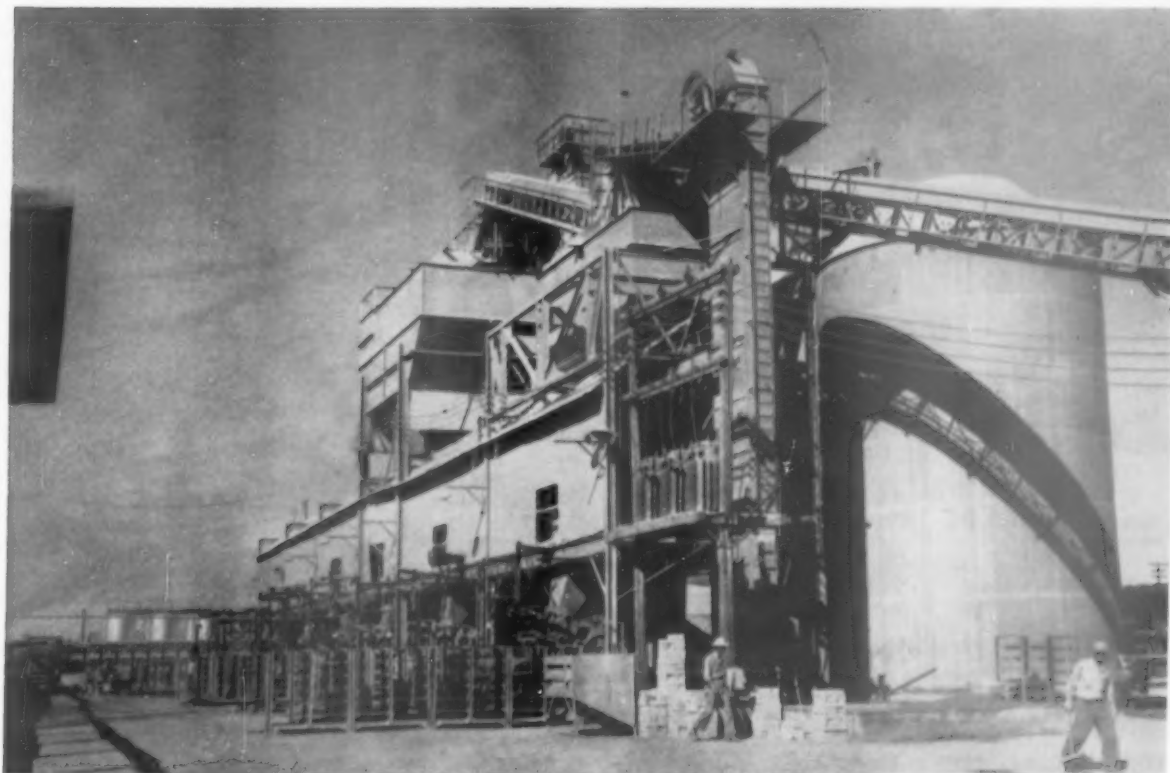


LONE STAR CEMENTS COVER  
THE ENTIRE CONSTRUCTION FIELD

## LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA.  
BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON  
INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK  
NORFOLK • RICHMOND • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 38,000,000 BARRELS ANNUAL CAPACITY



Largest concrete block plant in the world has acquired its seventh high-production block machine

## "Doubling Up" Cuts Block Plant Costs

### AUTOMATION

... has been applied by Builders Supply Corp., Phoenix, Ariz., to every phase of block handling to reduce costs and speed up production

By WALTER B. LENHART

WITH THE ADDITION of a seventh Besser Vibrapac machine, the Builders Supply Corporation, Phoenix, Ariz., continues to maintain its lead as the largest concrete block plant in the world. The seven machines operate around the clock, all under one roof.

High temperature, low pressure steam curing is practiced. Most of the aggregates used are volcanic cinders prepared in company-owned plants and shipped to the block plant by rail from deposits near Ash Fork (north of Phoenix). At the block plant the cinders are reprocessed for use. This operation was described in *ROCK PRODUCTS*, July, 1953, page 136. At the pit the cinders are given a preliminary crushing and screening and the fines, for the most part, discarded. The scoria or volcanic cinder is a reddish colored material. It is quite harsh,

strong and tough. It has low expansion properties. Very few hard aggregate blocks are made at the Phoenix plant.

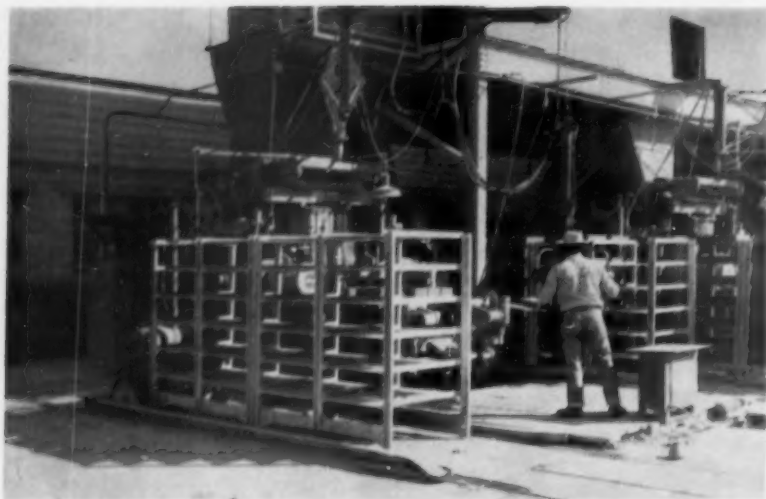
### More Efficient Handling of Block

In the previous article, the use of the Superlight unloaders was described, and how "doubling up" was practiced. Doubling-up refers to the inter-plant transportation of green and cured block. The lift trucks handle two instead of one rack, practically cutting the man-power and equipment requirements in half for this type of work. Now the doubling-up has been carried a step farther; two of the racks have been welded together making them essentially one unit. At the same time, a movable floor platform is provided on which the long racks are placed by the lift trucks. The floor platform can be moved ahead or reversed by

the operator (off-bearer) of the block machine. The platform consists of two parallel runways that are only a few inches off the floor. The two runways are a few feet longer than the long racks that now hold 144 standard 8- x 8- x 16-in. units. The parallel runways ride on rails via small diameter wheels with the drive motor mounted at the front end of the assembly and with chain drives from motor to wheels. The operator of the block machine moves the racks back and forth so that he does not have to extend himself to load the elongated racks.

### Recovering Concrete

A second important innovation is that under each Besser a company-made drag scraper has been installed. The drags, which are practically the inside width of the underside of the



**Racks are welded together** and are handled with one lift truck. Machine operator can move racks ahead or reverse by pressing a button on the controls which actuates moving platform on track.

block machine, are driven off the main shaft of the Besser and geared down to move at about 5 f.p.m. Drags are of the endless type similar to conventional sand drags. All spillage from the machine is carried to the rear of the machine where it dumps into a 6-in. diameter screw conveyor placed on the floor. The screw delivers the spillage to a small bucket elevator which returns the material to the batching section.

#### **Diatomite Improves Block**

A great advance in the technological aspects of better concrete has been incorporated into the mix design used at Phoenix. For several years, the company has maintained a research laboratory at the plant operated under the direction of Dr. George G. Olson. After several years of thorough testing, it was found that by the addition

of diatomite a whiter block could be made with a considerable saving in portland cement and with strengths maintained at customary high levels. Diatomite, or diatomaceous earth, as it is more commonly called, is a high silica, white, extremely fine grained material that was formed in some past geological epoch by a minute water organism (diatom). The diatoms formed vast colonies that eventually became large deposits of commercial importance. There are two forms of diatoms; fresh and salt water. The San Miguel deposit is said to be the fresh water variety. The deposit is practically pure silica with the silica present as opalite. Opalite is a form of silica that is chemically more active than other forms (quartz, quartzite, trydimite, crystobolite, etc.). The basic reason for adding this type of material to concrete is to stabilize the lime that is liberated

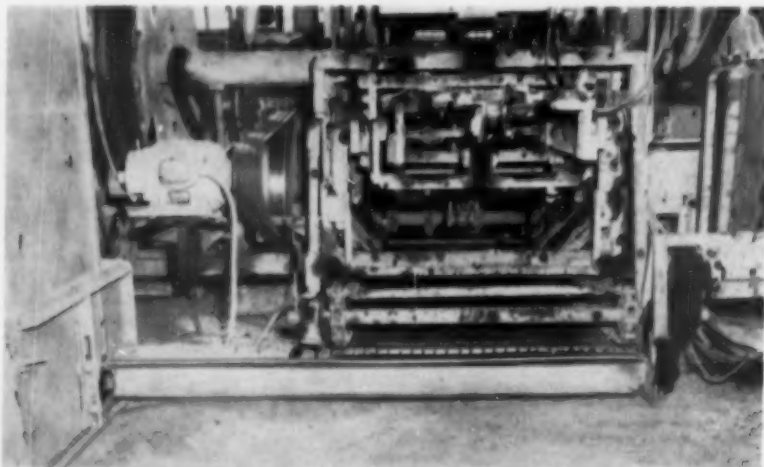
when concrete sets. The chemically active silica reacts with the freed lime forming a calcium silicate which is one of nature's cementing materials. This cementing action makes it possible to lower the portland cement requirements and still maintain specification requirements for the block. It is possible to substitute as high as 37½ percent of the portland cement used with finely divided diatomaceous earth and still maintain strengths. In addition the concrete is more durable for the free lime in concrete is at the root of many concrete disintegration troubles. The method of adding the diatomaceous earth at the mixer at the Builders Supply Corporation's plant is important and the company has applied for patents covering this and other new features.

Dr. Olson has formed an association with two other chemical engineers called "Arizona Research Consultants," and it is planned to equip a large research laboratory at Phoenix where custom research at a national level will be conducted. Equipment will include small rotary kilns (for lightweight aggregate work) and apparatus for the industrial mineral field. They are retained on a fee basis by the Builders Supply Corporation.

The company secures the diatomaceous earth from its own deposit located on the east bank of the San Pedro river near San Miguel, Ariz., about 40 miles northeast of Tucson. The diatomaceous earth deposit is 104 miles from Phoenix.

Two trucks with bodies similar to those used for hauling portland cement, transport the material from San Miguel to Phoenix; one truck is a White and the other a Kenworth unit. They haul 20 tons per load and average 10 hr. per round trip. The trucks are in service sufficiently to deliver about 60 t.p.d. to the Phoenix plant. All but about six miles of the road is paved.

The deposit at San Miguel is quite extensive and well up above the San Pedro river. Operations are very simple; a Caterpillar tractor-dozzer is equipped with a scarifier which first loosens the material and the dozer then pushes it over the rim of a bluff where a surge pile forms. The material is soft, white to light yellow in color and by this time is practically a powder with a few soft lumps in it. Under the surge pile is a screw feeder that delivers to a small Cedarapids hammermill. The product from the hammer mill falls to a short screw serving an inclined belt conveyor. It is practically all -100 mesh. No intermediate bins are used. Trucks load direct from the hammermill set-up. It takes about 30 min. to load a truck. One man at-



**Spillage of concrete** under the block machine is carried forward by drags to screw conveyor for delivery to bucket elevator for return to mixer



**Left:** Screw de-waterer for pumice. **Right:** Four attrition machines remove clay and silt from minus  $\frac{3}{8}$ -in pumice

tends to the entire diatomaceous earth operation. Electric power is purchased. Robert Miser is superintendent of the block plant at Phoenix and Gene Cryle is assistant superintendent. James Breed is in charge of the diatomaceous operation.

#### Pumice Block Plant

The company operates a block plant at Calapatria in the Imperial Valley section of California, using pumice as one of the principal aggregates. This plant and the pumice operation was previously described in *ROCK PRODUCTS*, August, 1950, page 234. At that time the pumice was processed dry. Since that time the plant has been rebuilt, changing it from a dry to a wet operation. Crushing through primary, secondary, and final crushers is much the same as previously described, using two jaw crushers for the first two passes and a set of rolls for the final

reduction. A  $\frac{1}{4}$ -in. to  $\frac{3}{8}$ -in. size, and a pumice sand are prepared in the wet washing and scrubbing plant. The scrubbing of the pumice is built around the use of four Western Machinery Co. (S.F.) attrition machines. The attrition machine is a development that stems from the silica sand industry where a clean sand is required for certain glass manufacturing purposes. It uses a vertical shaft to which are bolted paddles; all parts subject to wear are rubber-covered. These operate in an octagonal tank. The four at the deposit near Calapatria operate in series with each vertical shaft driven by a 15-hp. motor, or 60-hp. for the assembly. The units operate at relatively high speeds so that the pulp in the unit is subjected to severe attrition, grain against grain. Normally, for glass sands a pulp in the 75 to 80 percent solids range is used. This means a thick pulp so that scrubbing is better. At

Calapatria a thinner pulp does the job adequately. The battery of four Wemco attrition machines handle about 15 t.p.h.

The deposit is about eight miles from the block plant and all pumice is trucked into the plant. It is a hard, tough pumice and most of the material going to the plant has to be crushed as very little fines are present. Wind blown clay and silt are the main impurities removed by the scrubber which does a thorough job. Liners last about eight months and the paddles last about twice as long as the liners. Electric power is purchased.

#### Concrete Admixtures

THE NATIONAL SAND AND GRAVEL ASSOCIATION has issued Joint Research Laboratory Publication No. 2, entitled "Tests of Concrete Admixtures," which compiles laboratory investigations of admixtures made in the association's laboratory during the past 10 years. It consolidates and replaces several earlier publications which reported the work as it progressed. Comparisons of the effects of different admixtures as to air entrainment, effects on mixing water requirement and compressive strength of concrete are included. The admixtures are discussed both by class and by individual products. Data are also presented for a limited number of products on the effect of the admixtures on resistance of the concrete to freezing and thawing.

#### Leases City Property

THE ATLAS READY-MIX COMPANY, Oroville, Calif., has leased a gravel property from the city, agreeing to build and maintain its own roads and level the ground. The company will pay the city \$5¢ for each ton of gravel removed from the pit for six years.



**Pumice processing plant** looking from primary crusher. Note size of pumice on belt conveyor to crusher. Pumice is used as aggregate in block manufacture



Central batching plant, to the right, and 81- x 202-ft. garage-machine shop, to the left. The shop is built of tilt-up concrete walls. Yards are all paved

## Speed Up BATCHING

### DIAL BATCH CHARTS

... save operator's time in new central mix plant of Andersen Sand and Gravel Co., Saginaw, Mich. Strategically located, the plant also is designed to meet future demands in a rapidly growing area

By KENNETH A. GUTSCHICK

**K**EEN BUSINESS SENSE and a flair for ingenuity of management have produced one of the finest, most modern ready-mixed plants in the industry at Saginaw, Michigan. Built to keep abreast of a construction boom in that city, Andersen Sand and Gravel Company took advantage of strategic plant

location, modern design and construction plus unique plant features to provide the new ready-mix facility. It replaces an older plant that became inadequate to serve the growing market.

The new ready mix plant, started in July, 1954, is a combination central mix-central proportioning type with a

capacity of 150 cu. yd. per hour. It was designed and built under the supervision of F. N. Andersen, company president, who has had more than 25 years of operating experience in the sand and gravel and ready-mix fields. The present plant occupies a 9-acre site, which is more than adequate for



A 5-cu. yd. mixer truck receiving load at collector cone

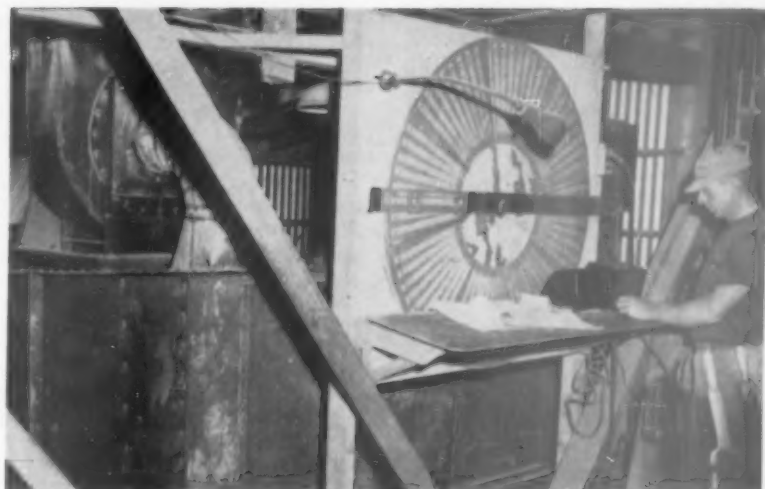


Ready mix plant with dispatcher office, to the left

handling the large volume of business it enjoys. The former plant was built in 1936 on an 0.8 acre site that could not be expanded in any direction.

Along with the ready mix plant, the company erected an ultra-modern office building, a large machine shop and garage, and a building supply warehouse and store which is operated by a subsidiary company. Total cost of the building program was in excess of \$500,000. As an excellent means of promoting the use of concrete, and to speed construction, the company used tilt-up concrete walls for the auxiliary buildings. Another construction feature is the completely-paved yard which facilitates truck movement.

**Plant location** is one evidence of Mr. Andersen's business acumen. Based upon a "Master Plan for Arterial Highways" in Saginaw announced in 1952, Mr. Andersen bought the new property at the intersection of two major proposed truck routes through the city; the site also is located strategically along two railroads—the C & O and the Grand Trunk. The highways in question are M46—an east-west road traversing the state and relocated

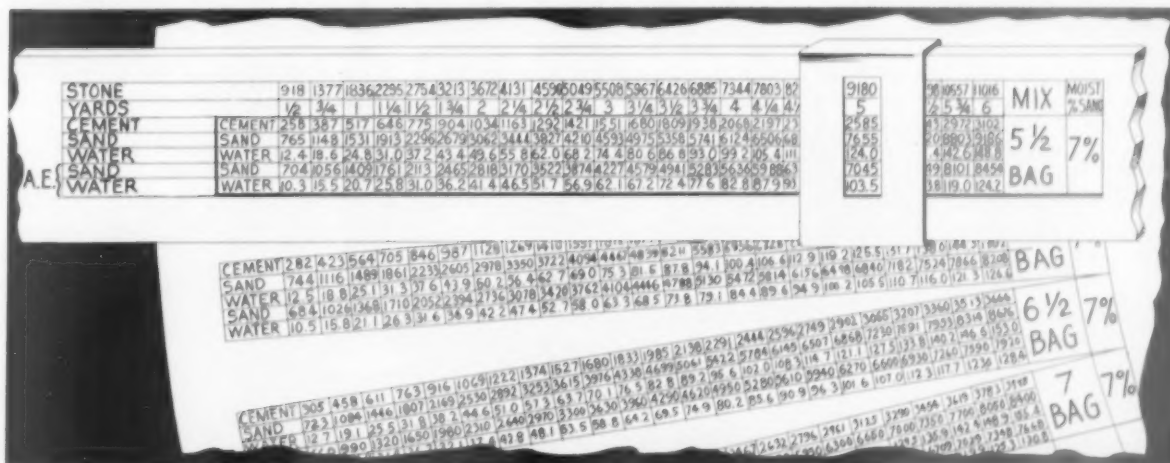


To the left, dust collector and fan, and to the right the dial-type batch chart mounted on batching floor

through the south part of Saginaw, and M13—a north-south state road which bisects the city. These arterial roads, now under construction, will speed materially ready-mix deliveries to all parts of the city and environs.

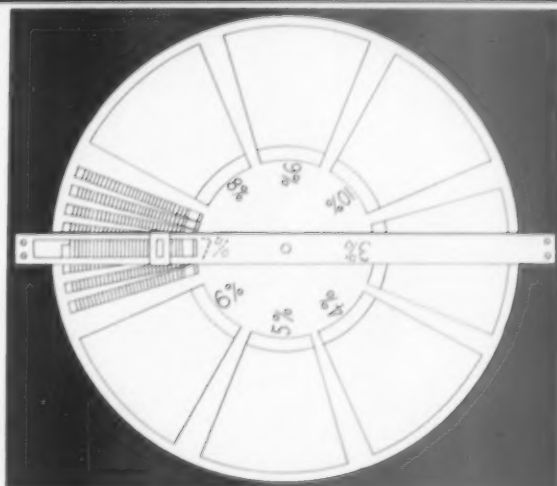
In addition, the new M46 will facilitate delivery of aggregates, which are trucked in from the company's sand and gravel plant located near this route about 30 mi. east of Saginaw.

**Key role of the batching operator**



Above: Blow-up of a portion of the "7%" segment, showing the batch weights for stone, cement, sand, and water in batch increments of 1/4-cu. yd. Two sets of figures for sand and water are given, corresponding to the use of portland cement and air-enriching cement, respectively

Right: Schematic of the Andersen Batching chart which consists of a 4-ft. rotating wheel and fixed horizontal scale bar. Mixes given in each of the eight segments are based on a sand moisture content, ranging from 3 to 10 percent. Each segment in turn is divided into eight mixes. The "window" on the fixed bar is used to line up the particular batch desired





Frank N. Andersen, president

is an outstanding feature among many that the plant contains. Besides operating the weigh batchers and central mixer, the batching operator also runs the material handling systems serving the overhead plant bins. The system for aggregates comprises a primary belt conveyor issuing from an underground truck hopper, a shuttle conveyor serving five ground storage bins, and a main plant delivery conveyor issuing from a reclaiming tunnel. The cement handling units include under-track and undersilo screw conveyors and a bucket elevator serving the silos and overhead plant bins. Push button controls for operating these units and all other plant facilities are centralized

in a control panel on the batching floor. The batching operator is actually the only one who starts and stops the various plant units. Ample window space is provided at the batching floor to enable the batcher to observe the whole plant layout.

Only two other operating men are required—one working the reclaiming tunnel gates and the other unloading the cement cars. These men get instructions from the batcher via Intercom units. Future plans call for controlling the tunnel gates automatically from the batching floor, in which case only one yard man will be needed.

**Strategic location of the dispatcher's office** is a second important feature. Located adjacent to the repair shop, the office faces the mixing plant and the truck entrance; it is set back 100 ft. from the plant and 200 ft. from the entrance. This permits the dispatcher to spot quickly a returning truck and immediately order the next load by Intercom. By the time the driver gets his delivery ticket and returns to the plant, the load is ready. It is also advantageous for the dispatcher to see the loading operation.

Other features include cement dust control in the plant through installation of a dust collector, extra large storage capacity for both aggregates (20,000 tons) and cement (12,000 bbl.), and use of two novel circular batch charts that serve to speed the batching operation. The large cement storage capacity has helped to prevent cement

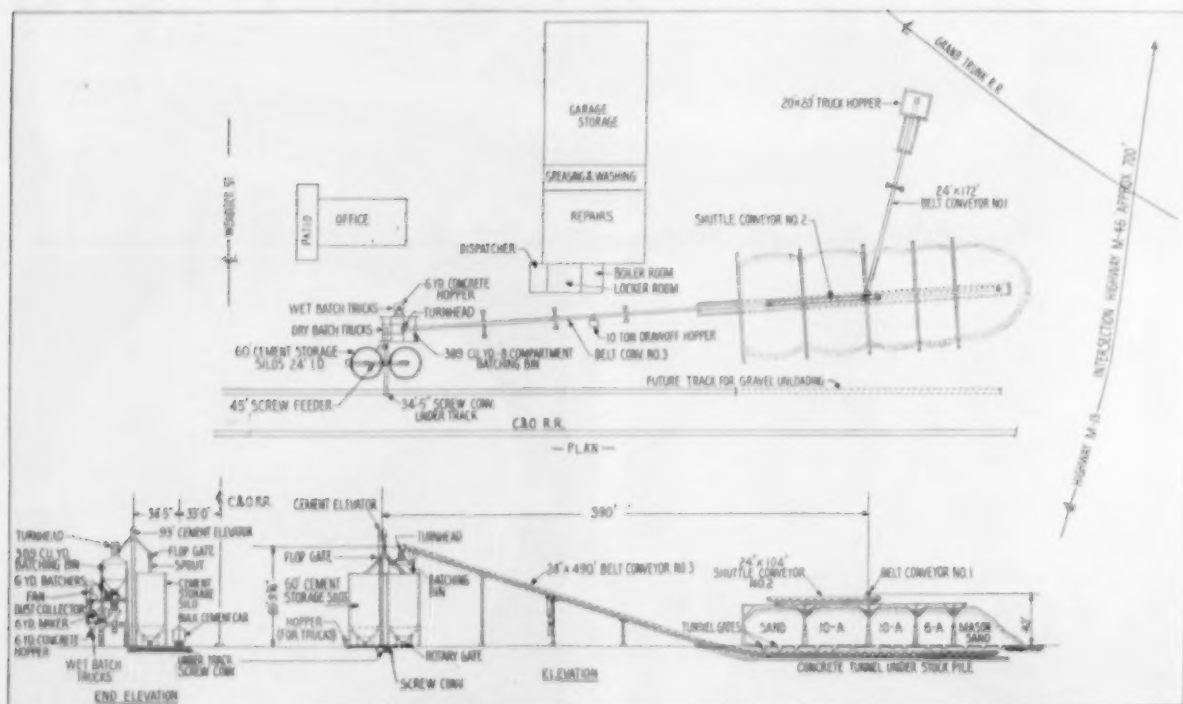
shortages at the plant. An important practice is to keep the silos full during the slack months in preparation for the peak spring business.

**The dial-type batch charts**, designed by Mr. Andersen, are mounted on 4-ft. dia. plywood wheels that are installed in the batching room. Their function is to reduce the batching calculations (which are made by the batching operator) to a minimum. One chart is designed for mixes containing Pozzolith, the other without Pozzolith.

Each chart consists of two parts—a wheel that is rotated according to the mix desired, and a proportioning scale bar fastened horizontally along the diameter. This bar contains a sliding indicator guide or "window" for lining up a particular mix. The wheel is divided into eight segments, each corresponding to a sand moisture content of from 3 to 10 percent. Each segment, in turn, is divided into eight mixes, including three different strengths (2500, 3000, and 3500 p.s.i.) and five different bag mixes (5, 5½, 6, 6½, and 7 bags, respectively). For each mix category, the weights for sand, cement, and water are given for batches ranging from ½ cu. yd. to 6 cu. yd., and in ¼-cu. yd. increments. Two sets of figures for sand and water are given for each mix—one for portland cement concrete, the other for air-entraining cement concrete.

Weights for coarse aggregate are given on the stationary scale bar, also

(Continued on page 218)



Elevation and plan details of ready-mixed concrete plant

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Unloading sand from balanced roll-over, side-dump trailer into underground hopper at ready-mixed concrete plant

according to batch increments of  $\frac{1}{4}$  cu. yd. This means that, for any given quantity of concrete ordered, regardless of strength required, the stone proportion remains constant. Thus, for varying the strength or slump, the amount of sand, cement and water is varied, conditioned by the sand moisture content.

Mr. Andersen's batch chart calculations are based on 4-in. slump concrete. For obtaining different slump values, the company uses the following rule of thumb; add 1 gal. of water per cu. yd. for each additional 1 in. of slump. This calculation is the only one the batching operator makes. Mr. Andersen feels that this novel system has been instrumental in eliminating batching errors.

The illustration on page 215 portrays the mix chart used for non-Pozzolite concrete. As an example of how it works, for a 5-cu. yd. order of 4-in. slump,  $5\frac{1}{2}$ -bag concrete (with 7 percent sand moisture content), the proportions are 9180 lb. stone, 2585 lb. portland cement, 7655 lb.

sand, and 124 gal. water. If air entraining cement is specified, the sand content is reduced to 7045 lb. and the water to 103.5 gal., the stone and cement remaining the same.

#### Ready Mix Plant

Material handling facilities feature concrete construction, where possible. Sand and gravel aggregates are delivered from the Andersen plant at Juniata near Vassar, Mich., in special company-built side- and bottom-dump tractor-trailer combinations and are discharged through a grizzly with 6-in. openings into a 20- x 20-ft. truck hopper of 100 tons capacity. Delivery to the battery of five ground level storage bins is by a 24-in. inclined conveyor, 172-ft. centers, followed by a 24-in. shuttle conveyor, 104-ft. centers; motor drives are 25- and 7-hp., and belt speeds 250 and 300 f.p.m., respectively. The shuttle conveyor is moved on double tracks by a 1-hp. motor. The system has a capacity of 250 t.p.h.

The concrete retaining walls are

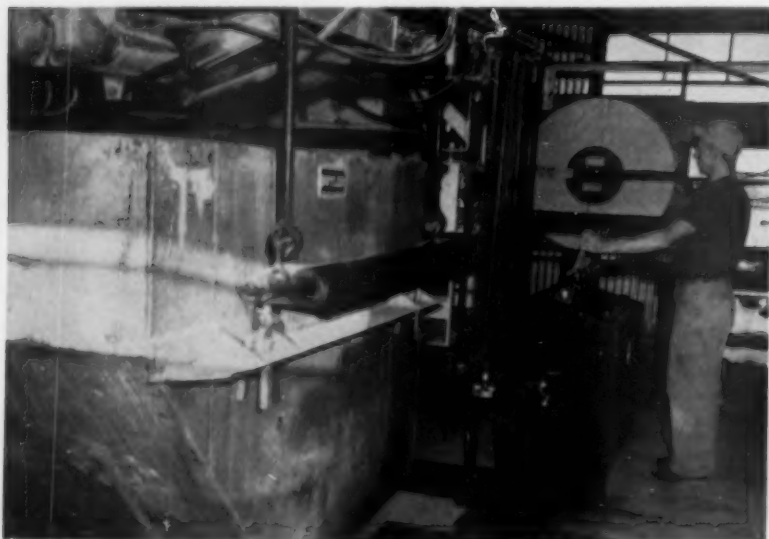
12-in. thick, 33 ft. high, and triangular in shape to correspond to the angle of repose of the aggregates. They are tied together by two angle iron frames and the two shuttle conveyor trolley supports. The bins vary in width from 30 to 50 ft., and have a total storage capacity of 20,000 tons. The bin floors are also concrete and pitched slightly towards the tunnel axis for drainage purposes. Two bins are used for 10A gravel ( $1\frac{1}{2}$  x  $\frac{1}{4}$  in.), one for 6A gravel ( $1\frac{1}{2}$  x  $\frac{1}{4}$  in.), one for concrete sand, and one for masons sand.

The reclaiming tunnel, also built of reinforced concrete, is rectangular in cross-section and measures 220 ft. long by 6 ft. wide by  $6\frac{1}{2}$  ft. high. The tunnel floor is pitched on a  $\frac{1}{2}$  percent grade for drainage. The tunnel gates are the quadrant-clamshell type and are spaced on 8-ft. centers; the number per bin varies from four to six. The main delivery conveyor, which elevates the aggregates 84 ft. to the overhead plant bins, is a 24-in. unit, 490-ft. centers; it is driven at 250 f.p.m. by a 40-hp. motor. The inclined portion of the conveyor is enclosed with arched corrugated aluminum metal for weather protection and dust control; the incline is 18 deg.

For handling straight loads, particularly of masons sand, the company has erected a 10-ton yard hopper adjacent to the main conveyor, with a belt plow diverting the material to the bin. Loads are weighed by a 20,000-lb. weigh batcher attached to the bin, since there is no truck scale available at the plant.

Bulk cement is stored in two 24 ft. dia. by 60 ft., 6000-bbl., reinforced-concrete silos; each has 6-in. walls, a steel hopper bottom, and a rotary gate. The cement conveying system consists of a 10-in. undertrack screw conveyor, 35-ft. centers; a 10-in. cross conveyor, 45-ft. centers, which serves both silos; and a 93-ft. bucket elevator. The system has a capacity of 200 bbl. per hr. To accommodate truck deliveries, the cross conveyor projects out from one of the silos to a small hopper. The bucket elevator discharges to a split spout, one spout serving the plant bin, the other a second split spout serving the silos. The entire material handling system, with the exception of the belt conveyor idlers and drives, was designed and fabricated by the company.

The batching plant, built of structural steel and enclosed with corrugated aluminum sheeting, is semi-automatic. It incorporates a 389-cu. yd. eight-compartment Butler bin; five compartments are used for aggregates, three for cement. The pivoted turn-head servicing the aggregate compartments is cable-operated from the batch-



Batching floor, showing 45,000-lb. aggregate weigh batcher at left. Chris Willadsen, batching operator, is weighing load



**Views of sand and gravel plant:** (A) is raw surge pile; (1) conveyor delivering washed dredged gravel to surge pile; (2) conveyor carrying dry pit run gravel to surge pile; (3) conveyor



rising from tunnel goes to plant proper; (4) conveyor returning crusher product to main conveyor; (5) conveyor supplying 3-ft. cone crusher; and (B) radial ground storage system

ing floor. The aggregate bin gates are air-operated, (through solenoids) whereas individual screw conveyors deliver cement to the cement batcher.

Each compartment has a high level indicator, the indicating lights and buzzers being located on the batching floor. The aggregate compartments are fitted with live steam lines for winter operation; these are attached to the hopper bottom. Steam enters the aggregates through about 40 spray nozzles, each projecting 6-in. into the bin.

The plant incorporates three weigh batchers, also supplied by Butler. The aggregate batcher is five-compartmented and has a capacity of 45,000 lb. Capacities of the cement and water batchers are 4000 lb. and 210 gal., respectively. Controls for charging the aggregate and cement batchers are semi-automatic, and centralized on a Butler control panel positioned in front of the scales. The water batcher has automatic controls; i.e., the flow is automatically shut off when the preset weight is attained. An automatic Pozzolite dispenser is used for adding air-entrainment.

Syntron vibrators are mounted above the air-operated gates of the cement and aggregate batchers and on the mixer feed chute to facilitate movement of materials. These vibrators are operated simultaneously, the push button being located on the batching control panel. A fourth vibrator is mounted on the collecting cone beneath the mixer; also controlled by batch operator.

Cement dust control is obtained by a Sly bag-type dust collector installed on the batching floor. It is operated in conjunction with a Sturtevant No. 611 industrial fan. The unit vents both the cement weigh batcher and the discharge end of the central mixer. Besides keeping the plant exceptionally clean, the installation saves about a sack or two of cement daily.

The mixer, located on the floor below the batchers, is a 6-cu. yd. Smith tilting type unit driven at 9½ r.p.m. by a 100-hp. motor. After 1-min. mixing time, the concrete is discharged into a 6-cu. yd. collecting cone, which has a manually-operated clamshell gate. Each driver loads his own truck.

A mixer bypass chute that leads from the batcher directly to the truck mixer can be used for producing transit mixed concrete only. During early operation, the company used both methods, often switching from one to the other several times each day. Because of flop gate trouble on the bypass chute, which slowed the overall operation, the company switched entirely to central-mixed concrete.

**The ready-mix fleet** at the Andersen plant consists of 22 tandem units, including 10 5-cu. yd. Westinghouse Transo mixers mounted on GMC 620 chassis; nine 4½-cu. yd. Smith mixers mounted on International L190 chassis; and three 4½ cu. yd. Jaeger mixers mounted on International K8 chassis. The Jaeger units haul 5½ cu. yd., the others 6 cu. yd. Seventeen of the trucks have power take-offs from the truck engine for driving the mixer; these reduce the tare weight by about 300 lb.

**Auxiliary buildings** combine the advantages of utility, good appearance and modern concrete construction. The combination garage-machine shop, built of tilt-up concrete walls, is 81 ft. wide by 202 ft. long. Half of the structure is used for truck storage and can accommodate 28 mixer trucks. This is especially important during winter. For greasing operations, there is a centrally located room, 20 ft. wide, with a 4-ft. deep by 3-ft. wide grease pit. The remainder of the building houses a well-equipped machine shop. The outside walls are 8-in., the inside 6-in., and the roof is crowned. Adja-

cent to the machine shop is a small building consisting of a boiler room, locker room, and dispatcher's office. The boiler is an oil-fired low pressure (15 p.s.i.) unit that supplies steam for the batch plant, aggregate bins, and also for heating water for the concrete mixer. An insulated 1000-gal. hot water tank on the batching floor is used for hot water storage.

Controls for motors in the batching plant and the auxiliary buildings are centralized on the mixer floor.

The 40- x 70-ft. office building (see cover photo) is of ultra modern design and features a front of granite facing and large aluminum windows. The remainder of the structure is concrete, including the floors. A 10 ft. wide patio in front of the building is landscaped with flowers and evergreens, and has an open top for sunlight. A 35-ft. concrete pylon, which is illuminated at night with a timing device, carries the company name.

The interior also is attractive, featuring acoustical ceilings, rubber tile floors (over concrete) and red oak woodwork. Besides the general office and Mr. Andersen's office, there are offices for the sales and engineering departments, a special conference room and a lunch room.

### Sand and Gravel Plant

The sand and gravel plant located at Juniata was revamped five years ago, with the addition of a primary washing station, primary surge pile, and a second (dry) pit. The plant was built in 1929 and, due to deposit depletion, was relocated at the present site in 1941.

**The principal feature of the present operation** is the wide use of blending on tunnel belt conveyors to produce specification materials. Beginning on the feed end, pit-run materials from two separate sources are delivered to



Close-up of aggregate ground storage system, showing main conveyor and shuttle conveyor. Walls are 33 ft. high and 12-in. thick.

the surge pile and then blended on a conveyor to meet plant requirements. One source is the original dredge-operated pit, which has a deficiency of sand and fine gravel. The other source, a dry pit, has an excess of sand and fine gravel, thus complementing the wet pit. In the plant proper, three basic sizes of sand and several basic sizes of gravel are produced, and then blended to meet specifications on individual tunnel belt conveyors leading to truck loading bins.

The newer (dry) pit, located 1000 ft. north of the plant, is about 20 ft. deep. It is excavated by two 7-cu. yd. Model D Tournapulls fitted with E9 scrapers. Each makes a round trip in about 5 min., unloading the material to an underground hopper. It then is moved to one part of the surge pile by an inclined 24-in. belt conveyor, 200-ft. centers. The second pit, located west of the plant, is about 50 ft. deep. It is worked by a hydraulic dredge that incorporates a 65-ft. Diamond cutter, a 10- x 12-in. Amsco dredge pump, and three Caterpillar D13000 diesel engines. Dredged material is pumped at 125 t.p.h. through a 10-in. pontoon-supported pipeline, 600 ft. long, to the land-based primary washing station. This consists of a 5- x 24-ft. revolving scrubber-screen with 1/2-in. openings, and two 18-ft. dia. Rotoscoops. The oversize drops to a short picking belt conveyor and the minus 1/2-in. material is dewatered by the Rotoscoops. Both products join and are delivered to the surge pile by a 24-in. belt conveyor, 740-ft. centers. Overflow from the washing plant is returned to the pond.

The surge pile has a live storage capacity of 10,000 tons, about three-fourths of which comprises the coarser dredged material. The reclaiming tunnel is 200 ft. long and has gates spaced on 10-ft. centers; the plant delivery belt conveyor is a 24-in. unit, 400-ft. centers. Due to frequent changes in size and gradation of material excavated from each pit, anywhere from 2 to 20 percent of the finer dry-pit material is blended with the dredged

gravel. Frequent samples are taken to assure optimum plant feed.

The washing and screening plant has a capacity of 250 t.p.h. It consists of a 5- x 24-ft. revolving double-jacketed screen, a 5- x 12-ft. double-deck vibrating screen, and an 18-ft. dia. Rotoscoop in series. Oversize gravel is carried by belt conveyor to a 3-ft. Symons standard cone crusher, which is closed-circuited to the revolving screen. Principal finished products include 2 x 1 in., 1 1/2 x 1 1/4 in., 1 1/2 x 1 1/2 in., 1 1/2 x 3/4 in., 3/4 x 3/4 in. (buckshot), 3/4 x 3/8 in. (for block sand), and minus 3/8 in. (masons sand). The Rotoscoop is used to dewater the latter product, the feed being derived from both screens.

A Kern radial ground storage system is used for all but two sand sizes, which are delivered to stockpile by a 24-in. stacker conveyor, 110-ft. centers. The basic gravel products are reclaimed on a 24-in. tunnel belt conveyor and blended to produce such sizes as 10A, 6A, 4A, etc. These are given a final rinsing on a 4- x 8-ft. screen mounted above a three-compartment, 500-ton truck loading bin. The sand products are blended similarly on a 24-in. tunnel belt conveyor, 320-ft. centers, which leads to a three-compartment, 500-ton truck bin. The block sand mix, which consists of a blend of 55 percent masons sand and 45 percent 3/8 x 1/4 in. material, is also stockpiled by a stacker belt conveyor issuing from the truck bin. Concrete sand is made by blending 35 percent buckshot with 65 percent masons sand.

The plant has one additional circuit that produces 100 percent crushed gravel. It incorporates a 3-ft. Symons short head cone crusher and a 3- x 6-ft. double-deck screen operated wet. The feed consists of 1 1/2 x 3/4 in. gravel from the revolving screen, which is crushed and then chuted to the double-deck screen. Oversize is returned to the cone by a bucket elevator, and the finished product (off the bottom deck) either 3/4-, 1/2-, or 3/8-in. material, is stockpiled by a 24-in. belt conveyor. Bottom deck throughs are wasted.

Individual steel yard bins built by the company are available for truck loading. They are charged from stockpile by a 2-cu. yd. P & H crane.

Delivery of aggregates to the ready mix plant over the 32-mi. haul distance is handled economically by a fleet of 9 company-built diesel tractor-trailer combination units. Seven incorporate semi-trailer and trailer bodies, each train having a total of eight axles and 30 tires, with a payload of 35 tons. The tractors consist of two Macks, four GMC's, and one Autocar. The two other haulage units are GMC tractor-semi-trailers, each hauling 18 tons. The trailer bodies on the seven vehicles are of two types—the balanced roll-over, side-dump type and the V-shaped hopper-bottom dump, with two hoppers to a trailer. This unique design permits large loads to be hauled without exceeding the load limit, and reduces damage to pavements. Mr. Andersen has been using this system of haulage since 1936. The round trip takes about two hours.

To increase haulage efficiency, Mr. Andersen has installed Servis recorders on the sand and gravel trucks. The drivers are required to account for all truck stops. In addition, recorders of this type are being used to determine operating time of the dredge and main plant. In the plant the unit is installed on the 400-ft. belt conveyor issuing from the surge pile.

Mr. Andersen is president of the company, his wife is vice-president, and James Whaley is secretary-treasurer. LaVerne Ellis is master mechanic and in charge of the ready mix operation. Art Lee is sales manager, Martin O'Brien is superintendent of the sand and gravel plant, Alec Grinkoski is manager of the building supply affiliate, and Chris Willadsen, batching plant operator.

Besides taking active charge of the various building material operations, Mr. Andersen is immediate past-president of the Michigan Ready Mixed Concrete Association, a member and former director of the National Sand and Gravel Association and a member of the National Ready Mixed Concrete Association. He is also a director of the Michigan National Bank in Saginaw and the owner of a 40-line bowling alley, also in Saginaw, which is the largest of its kind in Michigan. Mr. Andersen was also a former president of the Saginaw Chamber of Commerce and the Saginaw General Hospital.

BRAYTON CEMENT WORKS, Brayton, Iowa, has been purchased by Gary Brewer of Elk Horn, Iowa, from A. T. Rasmussen, former owner who had operated the firm for more than 50 years.

This is the 130th of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

# Another **BESSER BOOSTER**

## Vibrapacs are Preferred because they are "Recognized as the Best"

It takes a high quality machine to make a high quality product. That's why Price Brothers of Dayton chose Vibrapac machines. As Mr. Price himself states: "We selected Vibrapacs because they are recognized as the best, nationally."

The first Vibrapac was installed in the Price Brothers plant back in 1945. This machine produced high quality block on a fast production basis and with a minimum of downtime. So when additional equipment was needed in 1951, the company sent in a repeat order for another Vibrapac. Today, the plant is producing 2,500,000 eight inch (or equivalent) units annually.

Price Brothers believe in going after the entire market — block for walls, floors and roofs. Split block is produced under the trade name of **STONE-FACE**. In addition, batter block for manholes and catch basins are made at the same high rate of production as conventional block. All units are made on Vibrapacs.

**BESSER COMPANY • Box 135, Alpena, Mich., U.S.A.**  
Complete Equipment for Concrete Block Plants



Price Brothers executives, Dayton, Ohio: (left to right) Harry S. Price, Chairman of the Board; Louis E. Kline, Plant Supervisor; George W. Patterson, Sales Manager; Victor E. Scott, Block Plant Manager.



(Above) Yard scene at the Price Brothers plant at Dayton. In addition to concrete block, the company also produces pressure pipe and concrete sewer and culvert pipe.

(Right) Two Besser Vibrapacs installed at Price Brothers plant. Note irregular shaped batter block produced by machine in foreground. No manual lifting. Off-bearer merely guides the power hoist.



## NATIONAL HOUSING CENTER WASHINGTON, D. C.

(Sponsored by NAHB)

Besser Company maintains a permanent exhibit at the Washington Housing Center. Be sure to visit this fine display of concrete masonry.



*first* in concrete block machines

A 8704-1PBC

# RADIO

## Sells Concrete

### TEN STATIONS

... used by Hilltop Building Materials Co., Cincinnati, Ohio to keep in contact with ready mix truck drivers due to the hilly terrain

By HUBERT C. PERSONS

**S**TRATEGICALLY located ready-mixed concrete plants of Hilltop Building Materials, Inc., Cincinnati, and their more than 100 trucks and cars are now connected by two-way radio. This is proving to be an advantage to both customers and the company.

Advantages of radio delivery control to its customers have been emphasized by Hilltop through direct mail advertising. An attractive-four-color cutout of a hand holding a microphone was mailed to all customers and a list of potential users of Hilltop ready-mix. This carried the caption: "This Modern Working Tool Improves Hilltop Service on Your Jobs." The mailing piece contained a brief description of the radio installation and its advantages. Addresses and telephone numbers of all plants appeared on the back cover.

The radio installation, one of the most elaborate made in the building materials industry, comprises ten send-

Bevis ready-mixed concrete plant with mixer truck loading



ing stations of which five are in Cincinnati, two in Hamilton and three in Dayton, Ohio. The installations were made by the R.C.A. Service Co. after an intensive survey and field tests by Radio Corporation of America engineers.

A survey and tests were necessary because the hilly terrain of southern Ohio and the wide dispersion of the plants, presented a complicated problem in radio communication. Hilltop plants are located to minimize hauls of more than eight miles from any plant. It was thought at first that radio relay stations would overcome the difficulty due to the hills. But the setting up of ten different sending stations was

deemed a less complicated solution. As the system is now operated, each of the mixer trucks and the radio equipped cars of the four area managers and the operating superintendent is in effect a relay station. There is ready communication from base to base, from base to drivers and from driver to driver. This greatly increases the sending range and makes it easy to reach trucks which may be out of range with their closest plant operating base.

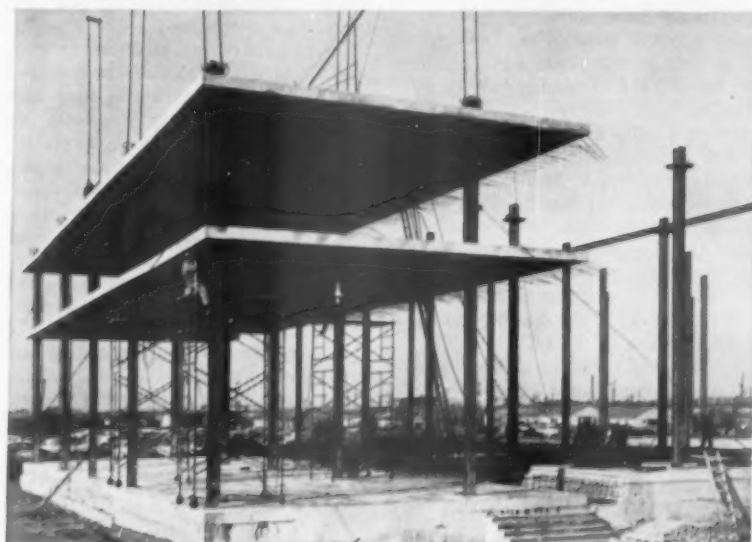
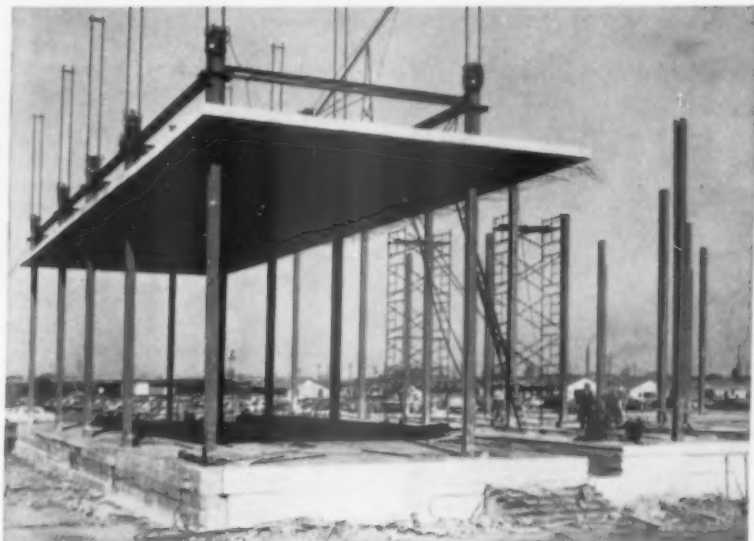
Before the two-way radio system was put into operation, R.C.A. engineers gave lectures to dispatchers and plant managers and to groups of drivers at each plant. The purpose of



John Pierre, production manager, talking on two-way radio in car



Bevis plant office: Bill Ruter, dispatcher, on left, talking on base set; George Koehler, plant manager, right, talking on telephone



## Goes up 20% faster this way

To erect a new 370,000 sq. ft. office building for the manufacturing divisions at Ford Motor Company's Rouge plant, in Dearborn, Mich., Long Construction Company of Kansas City used the lift slab method shown here.

The double "T" shaped building was divided into 28 "lift sections". Reinforced concrete slabs for the roof and floors of each lift section were then poured in one form at ground level. A sprayed-on resinous film kept the slabs separated and steel collars were embedded in their concrete around the supporting columns.

When hardened, the 400-ton slabs were raised in sequence, at about 4' per hour, by hydraulic jacks atop the columns. Welding the embedded steel collars to the columns then fixed each of the slabs in place.

The builders estimate more than 20% saving in construction time by this method. One great advantage is the economy of pouring all slabs at ground level, using mobile truck mixers of certified design, capacity, mixing speed and accuracy of water control.



You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

**BLAW-KNOX CONSTRUCTION EQUIPMENT DIV.**  
Mattoon, Ill.

**CHAIN BELT COMPANY**  
Milwaukee, Wis. and Los Angeles, Calif.

**CHALLENGE MANUFACTURING CO.**  
Los Angeles, Calif.

**CONCRETE TRANSPORT MIXER CO.**  
St. Louis, Mo.

**CONSTRUCTION MACHINERY CO.**  
Waterloo, Iowa

**THE JAEGER MACHINE COMPANY**  
Columbus, Ohio

**THE T. L. SMITH COMPANY**  
Milwaukee, Wis.

**WILLARD CONCRETE MACHINERY CO., LTD.**  
Lynwood, Calif.

**WORTHINGTON CORPORATION**  
Plainfield, N. J.



John F. Steele, executive vice-president at his desk

the meeting was to set up code systems to prevent cluttering up the air with long messages. They also assisted in getting the necessary license from the Federal Communications Commission. Hilltop has a maintenance contract with the R.C.A. Service Company. This organization has offices in Cincinnati, Hamilton and Dayton where spare parts and complete sets are in stock and service is available 24 hours a day.

Because Federal regulations require high frequency transmitters in areas with a population of more than 500,000, the five sending stations in Cincinnati operate on what is known as

the Citizens' Band, ultra-high frequency—450 to 470 megacycles. The sending stations in Hamilton and Dayton operate on a low frequency—30 to 50 megacycles.

Hilltop's radio installation has done all that was expected of it and more, according to John F. Steele, executive vice-president. "We had heard of successful radio installations in concrete plants in other parts of the country," Mr. Steele said, "but we were a bit concerned as to whether an installation would be economically feasible in Cincinnati because of the high hills. The survey and field tests made for us by R.C.A. engineers convinced us that a

radio system would be a good investment.

"One of the things we hoped to accomplish through two-way radio," Mr. Steele said, "was to have direct contact with the drivers at all times. We wanted to have direct contact with the drivers at all times in order to get the maximum use from our trucks. Certainly our two-way radio enables us to serve our customers more efficiently because we are in closer contact with them. If slump corrections on the job are required, a radio call to the plant can correct slump."

According to Mr. Steele, the Hilltop drivers are enthusiastic about the radio set-up because when a truck is in trouble the driver can get help in a hurry without a long walk to find a telephone. Then too, he can talk to the area manager or superintendent at any time to decide such matters as whether he should risk driving his truck onto wet ground where it might bog down, or whether he should wait at a job at the request of a contractor.

One substantial saving in time and labor made possible by the radio installation, Hilltop executives say, is the ability to re-schedule trucks quickly and thus reduce late deliveries. Deliveries can be slowed or speeded up to meet requirements. Contractors can keep in direct communication with the ready-mixed concrete plant and with the company's supervisors and engineers. With this ready communication, breakdowns can be repaired without serious delay to the customer. In emergencies

(Continued on page 250)



Attractive three-color cut-out of a hand holding microphone which was mailed to all customers and potential users of ready-mixed concrete. To the left, is the cut-out folder, closed; to the right, folder in open position



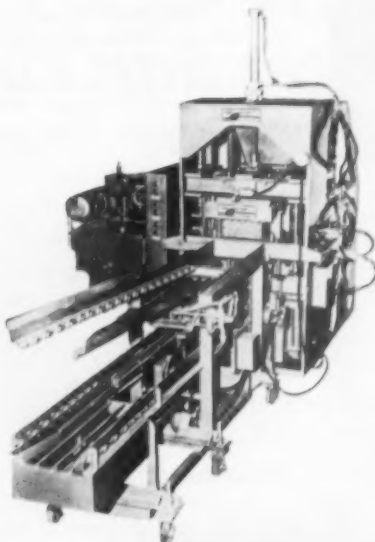
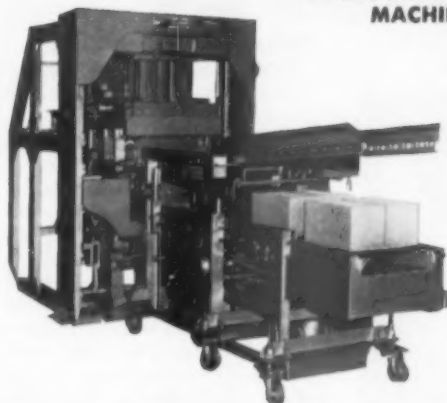
Let All Hilltop Extra Service Radio Controlled Delivery Add Nothing Extra To Your Cost.

HILLTOP BUILDING MATERIALS, INC.

SEE PLANT ADDRESS ON BACK PAGE

**MAXIMUM PERFORMANCE**  
for a  
**MINIMUM INVESTMENT**  
with the 10-20-25  
**FLEMING block machines**

**MODEL "20"  
DOUBLE BLOCK  
MACHINE**



**FLEMING**

**MANUFACTURING COMPANY**  
487 FLEMING AVE., CUBA, MO.  
PHONE: CUBA 400

Fleming Manufacturing Company's advance design series 10-20-25 block machines all have two mighty important factors in common: *Maximum performance*—the proved ability to perform steadily, dependably, with maximum production and minimum maintenance. And, *low initial cost*. You can pay a great deal more, but you simply cannot buy a better block machine than Fleming. Write or phone today for complete information and price list.

**Vibration Taken Off The Machine**

Agitation by Fleming's exclusive Roto-Pak virtually obsoletes old style agitation; affords fast, accurate filling of all molds. Vibrator is *completely removed* from machine, mounted on solid steel anvils, isolating and directing maximum vibration into the molds only. This prolongs life, prevents wear and tear. Front pallet feed and block ejector is included in the purchase price, a factor which must be considered when comparing prices.

**All Steel Welded Construction**

Positive cam control; fool-proof hydraulic system. Multi cam operation assures maximum flexibility. Design affords quick, simple mold box change. Positive height control.

**Off Bearer Supplied 2 Ways**

Your choice of air or hydraulically operated off-bearer.

**Five Cycles Per Minute**

The Fleming No. 20 is factory tested and approved at five cycles per minute. Cycle will vary according to operating conditions.

**MODEL "25"**

This larger machine and molds utilize a pallet 18" x 22", producing masonry units within this capacity. Especially attractive for 10" units, bricks and slabs. Also permits production of one 12" and one 8" unit per pallet, plus all other combinations.

**MODEL "10" SINGLE DOWN STRIPPER**

Advanced features included in this single block machine formerly were found only in larger, far more expensive machines. Outstanding among these is the front pallet feeder, and ejector; the electronic height control, and the multiple cam drive. (Machine is set at the factory to cycle five times per minute) Low in price, absolutely tops in performance.

**MAIL TODAY!**

Gentlemen: Please rush complete information, including specifications, prices and terms on the following:

- ☐ FMC 10      ☐ FMC-180 (fully automatic concrete block machine)  
☐ FMC 20      ☐ FMC Block Splitter  
☐ FMC 25      ☐ FMC Stationary Mixers

NAME .....

ADDRESS .....

CITY .....

ZONE      STATE

## NEW MACHINERY



### Electronic Moisture Meter

C & W SALES CO., INC., 1490 Franks Lane, Menlo Park, Calif., has brought out an electronic moisture meter for installation in a bin or hopper to instantly determine the moisture content of sand or gravel. The meter records electrically to an indicating gauge, which can be installed at various locations, measures the amount of surface moisture in any material contained in the bin or hopper, and indicates the moisture instantly to the plant operator. In concrete batching, even if each load has a different moisture content, the moisture meter eliminates guess work.

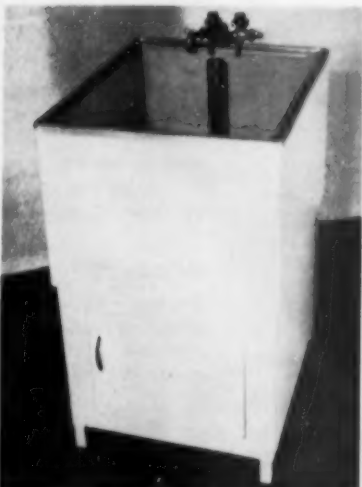


### Lift Truck Drive and Unloader

TOWMOTOR CORP., Cleveland, Ohio, has announced TowmoTorque drive and the Towmotor Unloader Attachment for use on its fork lift trucks. The drive provides the correct torque to the truck's drive wheels, as required by changing operating conditions. A special Creep Control feature enables guiding the truck into the position required and, at the same time, helps in maintaining high engine speed for full

hydraulic power in lift, tilt or hydraulic accessory operation.

The materials handling attachment, available as a standard accessory, permits mechanical unloading and placing of both palletized and non-palletized loads, including crates, cartons, bags and drums, through the use of equalized hydraulic power, eliminating the need for manual handling. Unloading operations are controlled by a lever located at the operator's finger-tips. The accessory also makes it possible to push heavy unit loads off the forks and into position, reducing loading time in shipping operations.



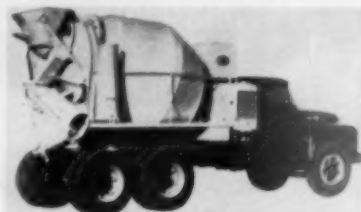
### Concrete Laundry Tub Mold

CONCRETE MOLD & ENGINEERING CO., Battle Creek, Mich., has announced a space saving concrete laundry tub, designed specifically for use with automatic washers. The tub features a utility cabinet below, made of steel with baked enamel finish to match the exterior of the tub. Forms and accessories are available to concrete products manufacturers on an exclusive license basis.

### Masonry Water Repellent

THE MONROE CO., INC., Cleveland, Ohio, has announced Monoseal, a water repellent for exterior masonry walls, with a fungicide added. The silicone base liquid is said to penetrate from 1/4 to 3/8 in. into masonry surfaces, and is transparent and colorless so as not to alter the surface appearance in any way. It can be applied by either brush or spray with only one coat being usually necessary. Because

of the silicone content, it does not close masonry pores, but coats the pore walls and still permits the masonry to breathe. The fungicide content is said to prevent fungus growth, particularly in warm climates where molds and mildews are normally prevalent. It is also claimed to be impervious to oxidation and to stop efflorescence.



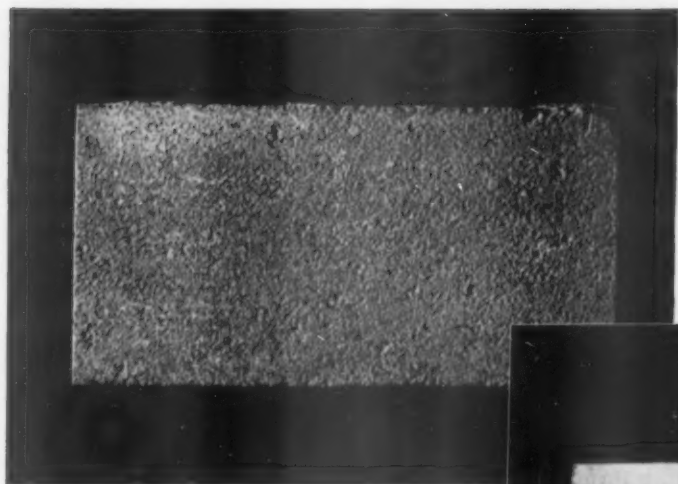
### Transit Mixers

LETOURNEAU - WESTINGHOUSE CO., Westinghouse Transit Mixer Div., Indianapolis, Ind., has announced an improved line of transit mixers in five sizes, 4 1/2 to 6 1/2 cu. yd., featuring a fully enclosed gear drum drive, two-speed transmission, double-action mixing drum, and a swing-away chute for direct discharge. The units also feature a self-aligning drum mounting to eliminate truck and mixer frame flexing on rough terrain. Misalignment is further prevented by a ball-and-socket front end mounting at the drum. The swing-away discharge chute eliminates the need for removing and replacing the chute head when the truck mixer is discharging into high forms, hoppers or buckets. The operator pulls two pins, swings the chute out of the way, swings it back and relocks it in normal position.



### Lightweight Vibrator

MARTIN ENGINEERING CO., Neponset, Ill., has developed a bantam-size vibrator for operation on steam or air, designated the Vibrolator SAH-10, which weighs 4 oz. It is designed for use on hoppers, feeders, molds, gauge panels, packaging machines, etc. Vibration frequency is variable from zero to 50,000 c.p.m., and operating pressures may vary from 5 to 150 p.s.i. The unit is said to be self-starting, self-cleaning, sparkproof and afford quiet operation.



← **ORDINARY BLOCK Without NR PLASTIC—  
ROUGH FINISH, DARK COLOR**

**IMPROVED BLOCK\* With NR PLASTIC—  
SMOOTH FINISH, LIGHTER COLOR**



\* Manufactured at HOERNING'S CONCRETE PROD. CO., Menasha, Wisconsin.



*With*  
**JUST ONE TABLESPOON OF**  
DRY, POWDERED  
**NR PLASTIC**  
PER BAG OF CEMENT!

**GREATER PLASTICITY IN THE GREEN UNIT —  
PLUS 20% LIGHTER COLOR ...**  
**Cost. . . 1/2¢ per Bag of Cement!**

Hydrate ALL the cement in your dry block and pipe mix . . . with just *one* tablespoonful of dry, powdered NR PLASTIC per bag of cement. Cost. . . . . 1/2¢ per bag!

**YOU'LL GET . . . . .**

A 20% lighter colored unit with a more thoroughly wetted cement paste! Complete hydration through complete saturation without adding more water! Sharper

corners . . . better texture . . . smoother, denser surfaces through greater compaction! Faster, cleaner feeding into . . . and stripping from . . . the mold box! 50% reduction in wear on mold box liners! Greater plasticity in the green unit through absolute dispersion of water and cement . . . and . . . complete coating of all the aggregate particles! Simple and economical to use . . . add dry as it comes from the container! Cost 1/2¢ per bag of cement!

**MAIL COUPON TODAY** ▶



427 W. National Ave. Milwaukee 4, Wis.

Write for literature and free 3 lb. sample of NR PLASTIC.

**Edick Laboratories**

427 W. National Ave., Milwaukee 4, Wis.

Gentlemen, Please RUSH Sample of NR PLASTIC

NAME . . . . . TITLE . . . . .

FIRM . . . . .

ADDRESS . . . . .

CITY . . . . . ZONE . . . . . STATE . . . . .

this  
air-entraining agent  
can save you money  
**4 ways!**



...and  
**Ertrane C** can be  
added either dry  
or in solution



More and more manufacturers of concrete block, prestressed concrete, pipe and other concrete products are proving to themselves the *real* savings and increased profits made possible by switching to Ertrane C for their air-entraining agent.

It's easy to see why. Look at the *exclusive* advantages of Ertrane C over other air-entraining agents:

1. Lightweight—easier handling and storage. Ertrane C is packaged in a 60 lb. multiwall bag.
2. Lower shipping costs. Ertrane C is 100% active; you are not paying freight on water. Also no danger from freezing.
3. Flexibility of use. Ertrane C can be used either dry or in solution. 3 bags (180 lbs.) of Ertrane C into 125 gallons of water make a 15% solution.
4. No additional chemicals required.

*So by all means make us prove it.  
Write today for complete information  
on ERTRANE C.*



PLANTS: Harrison, N. J.  
Cedartown, Ga. • Richmond, Calif.  
London, Ont. Canada



Some of the essential records for proper control of concrete quality. Fig. 1: Aggregate sample request form. Fig. 2: Concrete mix number card and strength data. Fig. 3: Batch change card. Fig. 4: A check-off inspection form which helps operator to keep informed about plant operation

## Control and Inspection of Ready-Mixed Concrete

By E. L. HOWARD\*

**M**ANY CONCRETE JOBS have "not so good" batches delivered because the controls were not properly operating.

Inspectors assigned to batch plants by the customer's representatives are not the answer to quality concrete. Usually the inspector arrives with the mix proportions just before the trucks are to be loaded. He can observe the weighing and loading. He can accept or reject materials, but his contribution to concrete control has been applied too late in the production schedule.

Samples of cement and aggregates for testing and examination have to be taken by someone before the concrete mix proportions can be set. This someone should know how, when, and where to get the samples. These materials for testing must be completely representative of the materials that go into the job. Adequate records should be kept by the supplier of the samples submitted. Aggregates can be or-

dered as per sample by using a request form like that in Fig. 1.

Cement producers can supply test data and conformity certificates on material delivered to a batch plant. Because compressive strength and water-cement ratio are the heart of all specifications, the ready-mix concrete man must insist upon uniform high quality cement.

Admixes are not cure alls in concrete control. Rather, they increase the problem and the necessity of inspection. Knowledge of the admixtures' effect in concrete using a given cement should be known. Admixtures change the "look and feel" of concrete. This adds to the problems in quality control.

To insure the uniformity so essential to good concrete on the job, the concrete producer will find it necessary to check the materials shipped to him. The facilities for such work can

be as elaborate as the size of operations might dictate. Minimum requirements would include the equipment listed in the Manual of Concrete Inspection, page 6, as published by American Concrete Institute.

The producer should be able to design his own mixes and check the customer's concrete mix proportions. The gradings, unit weights and the specific gravities of aggregates are necessary information for concrete mix proportioning. He must know the normal strength yield of each brand of cement used in his plant. The latter data might be obtained from several jobs or from a special laboratory research, but its importance should not be overlooked. An example of strength differences in brands of cement is illustrated in Table 1.

A mix proportion should be identified by a number, once it has been

(Continued on page 232)

Table 1: Comparative Water-Cement Ratios using Several Brands of Cement

Compressive Strength 28 Day p.s.i.	Gallons Water per Sack of Cement			
	Brand A	Brand B	Brand C	Brand E
2000	10	9½	8	9½
2500	9½	8½	8	8½
3200	8½	8	7½	8
4000	7½	7	6	7½
5000	6½	5½	5	6

\*Chief testing engineer, Pacific Coast Aggregates, Inc.



# They're swapping minutes for dollars!

## **Worthington MIXERAMA proves on your job that a Hi-Up Mixer earns more for you!**

You're looking at the unique new truck mixer demonstration that's got the Ready-Mix industry buzzing!

Hundreds of Ready-Mix men are finding out at MIXERAMA that no other truck mixer is in the same league with the Worthington Hi-Up. MIXERAMA is an eye-opening exhibition of Hi-Up performance — *and you see it at work right on your own job!*

Sure, we're proud of the Hi-Up Mixer. So proud, in fact, that we make a special point at MIXERAMA of letting you do just about anything to the Hi-Up that strikes your

fancy. Try out the clutch . . . swing out (or on!) the sturdy discharge chute . . . climb *inside* the drum (of the Cutaway Mixer)—we want you to see for yourself just why we say the Hi-Up Mixer is your best buy . . . why no other mixer is in the same league when it comes to delivering *more uniformly mixed concrete faster!*

Tell your Worthington distributor you want to see MIXERAMA, with a Hi-Up loading at your plant and then delivering concrete to your current job. Or watch MIXERAMA in your area—your distributor will set up the date. It's the most convincing demonstration you've ever seen. And it's staged under operating conditions that *you* select . . . the tougher, the better! Call your Worthington distributor today and tell him you want to see MIXERAMA right away.



## The Whittemore Co. watched MIXERAMA ... then bought Five Worthington Hi-Ups!

**Whittemore Co. V.P. says, "I've never seen a more sensational demonstration — nor a better truck mixer than Hi-Up"**

Mr. A. Lovetere knows truck mixers inside out, knows from years of experience what kind of performance they *must* deliver to pay off for him.

Just recently he attended a Worthington MIXERAMA. As he says, "There's no better way to find out what a Worthington Hi-Up Truck Mixer can really do. And what I saw sold me completely on Worthington."

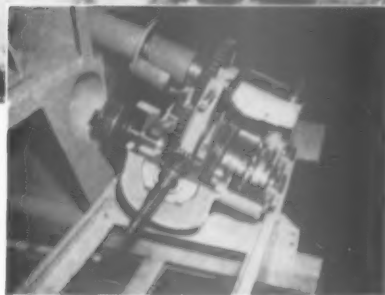
I also learned that one of the basic

reasons for Hi-Up performance is Worthington's big research program on concrete mixing. They've built their research findings right into the Hi-Up design—and you can see the results in the quality of concrete it delivers.

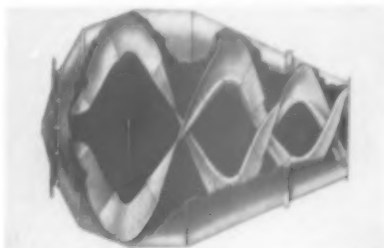
Every man in this business ought to see a MIXERAMA demonstration—it certainly opened *my* eyes. For me, there's no better truck mixer than the Hi-Up."

### Be next in line!

See the Hi-Up in MIXERAMA or see it at your Worthington distributor. Worthington Corporation, Concrete Machinery Division, Section R.6.1A, Plainfield, New Jersey.



*Toughest transmission built today. No adaptation of commercial unit, it's designed for mixer use. Single-lever operation for easy control from either end.*



*Beating this drum is impossible! Drum and blades are made of abrasion-resistant steel. Blade design gives thorough mixing, fast discharge. Advanced water system for precision mixing.*



# WORTHINGTON



If It's a Construction Job, It's a **Hi-Up** Job

V-Belts • QD Sheaves • Air Compressors • Air Tools • De-Watering Pumps • Truck Mixers

established. Using a card similar to Fig. 2, weights of a concrete batch and the job as well as strength data can be kept for ready reference. When mixes are so identified, the dispatcher need put only the mix number on the delivery ticket. The customers soon become accustomed to order concrete by the number assigned their own mix. The use of batch cards (Fig. 3) with carbon copies for engineering and production departments eliminates transcribing errors and keeps those responsible for quality control of the concrete informed of each mix change.

**Careless practices** common to some operations can quickly ruin both aggregates and cement. When the concrete producer has aggregates and cement delivered to him within the specifications, and has set up his mixes ready for batching he sometimes feels his control job is in the hands of our inspector. Improperly cleaned bucket lines, chutes, and hoppers will contaminate otherwise clean material. Chutes without baffles or some type of collecting hopper allow flowing material to segregate. Cements may become mixed and contaminated by careless handling. Admixes poorly stored and inaccurately measured add greatly to the quality control problem. Batch gates should cut off correctly and weigh hoppers must be clean and properly balanced. A check off inspection (Fig. 4) helps to keep an operator informed about his plant operation.

**The batch man** alone should batch water to a concrete mix. The most popular ingredient in concrete is water. This item is believed by some to have all the magic qualities of a patent medicine. If and when the foreman of a concrete crew demands water added



Fig. 5: Using Kelly ball on job. Concrete sample will be used for cylinders

changes without careful testing. A properly proportioned mix, batched in an efficient plant, and delivered at the designed slump with accurate job testing and control will yield trouble free concrete. A Kelly Ball should be handy on every job where good concrete is desired. This method of consistency control (A.S.T.M. C 360) is quick and easy to make. Once the desired penetration is determined, each load may be tested in a matter of seconds. A service man, the eyes of a batch plant operator, should visit the jobs, measure the consistency (Fig. 5) and order any adjustments needed to maintain quality concrete. Table 2

Table 2: Comparative Cement Requirements in Concrete Mixes for 3000 p.s.i. Minimum Compressive Strength

	Coefficient of Variation	Cement Content
No Service man on job	19.0	6.6 Sks/cu. yd.
Service man on job	9.1	5.5 Sks/cu. yd.

on the job, he should sign the tag showing the water added and assume the responsibility for it. Moisture meters now available, for measuring the free water in sand, make possible excellent slump control.

Batch men have little difficulty loading concrete as designed and ordered. The hitch comes when the concrete is delivered and the customer takes a slump by the "eye-ball" method. The very carefully made 4-in. slump delivered invariably tests about a 2-in. After water is added to the customer's satisfaction, the slump will be 5 in., "eye-ball" (this method of test does not record results over 5 in.).

The concrete will lack uniformity and quality that the designer had hoped for if the people on the job can add water and make other mix

illustrates the savings in cement on a job after efficient control was established.

All these matters are small things when considered singly, but depending upon their observance can add up to success or failure of a concrete placement. One of the ancients has left this bit of advice quite appropriate for our use: "Let no man leave undone the small things for there is much in the futurity which depends upon them. Therefore, let us do all things in our power, and then may we stand with the utmost assurance that our hopes will be accomplished."

### Cinder Block Development

THE CINCRETE CORP., Long Island City, N. Y., recently introduced cinder block forms, known as "Levitt Shapes,"

which are prefabricated to form interior and exterior wall components when assembled. The block shapes were designed by Alfred Levitt to be used in the construction of his apartment project in Queens, N. Y. One of the block designs is solid except for a 1-in. slot, designed to enclose structural steel framework members. This block is said to fulfill insulation requirements and also serve as a finished wall surface. It can be used wherever steel framework must be fireproofed. The interior walls can be painted and repainted, due to block smoothness and texture, as well as hold nails or other fixtures.

A second block introduced by The Cincrete Corp. is a special U-shaped unit, designed to enclose and cover exterior spandrel beams. The units are prefabricated to become part of the building design and for fast assembly with other structural elements. George Kogel, president of Cincrete, stated that the blocks can be used in almost any form of construction.

### N.C.M.A. Research

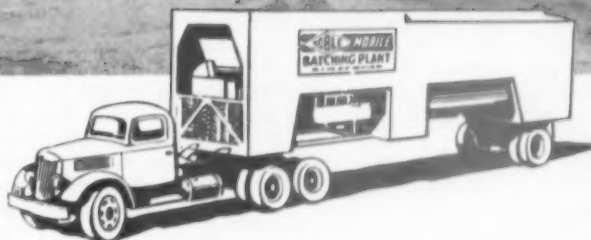
THE NATIONAL CONCRETE MASONRY ASSOCIATION has set up a \$7500 grant at the University of Toledo Research Foundation, to finance two research projects. Conducted by Edwin L. Saxer, professor of civil engineering, the projects will consist of an investigation of the bond strength of various mortars and concrete masonry units, and a study of the effects of artificial carbonation of concrete masonry units. The projects are scheduled for completion within a year.

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*Comparatively small investment in Noble-Mobile eliminates the cost of 8 additional trucks that would be required for the 14 mile haul if batching were done at the base plant, reports Joseph Amis, Wamix, Inc., Dallas, Texas. On this Centex Construction Co. housing project, Noble-Mobile is supplying 50,000 yards of concrete for 1500 slab foundations.*



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...batched automatically • Excellent quality control Maximum production from mixer trucks—short hauls, more yards per day • Production capacity 60 to 100 yards per hour • Covered by patents pending.



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J. J. Seale, center, new president, flanked by vice-presidents, **Homer Peterson**, left, and **Bruce N. Spencer, Jr.**, right

## Agricultural Pipe Producers Meet in Denver

**H**IGHLIGHTING the meeting of the American Concrete Agricultural Pipe Association in Denver, Colo., April 12 to 14 were outstanding papers presented by James E. Mandry and Lewis H. Tuthill of the Bureau of Reclamation, Prof. Philip W. Manson of the University of Minnesota, and a discussion of a new specification for irrigation pipe lines. This technical discussion was led by Prof. Arthur F. Pillsbury of the University of California, Tyler H. Quackenbush, irrigation engineer from Washington, D. C., and Lester Lawhon, Soil Conservation service engineer, Fort Worth, Texas.

Officers elected were: president, J. J. Seale, Concrete Conduit Co., Colton, Calif.; vice-presidents, Bruce N. Spencer, Jr., Gifford-Hill-Western, Inc., Lubbock, Texas and Homer Peterson, Rockite Silo, Inc., Hutchinson, Minn.; secretary, Glenn Harriman, Indiana Lock Joint Concrete Pipe Co., Lafayette, Ind.; and re-elected treasurer, Wm. B. Freeman, Lock Joint Pipe Co., Denver. Directors of the association for 1956 are: Earl H. Eby, Elk River Concrete Products Co., of Montana, Helena, Mont.; G. D. Williamson, Valley Concrete Pipe Products Co., Yuba City, Calif.; and Charles E. Ward, Utah Concrete Pipe Co., Ogden, Utah.

### Pipe Distribution System

James E. Mandry, assistant head of the Canals and Pipe Line Section, Bureau of Reclamation in Denver spoke on "Full Pressure Concrete Pipe Distribution System." Trunk laterals installed by the Bureau of Reclamation have sufficient capacity in certain cases to serve a city of 750,000 people,

Mr. Mandry said. He said that a farm delivery line has enough capacity to provide water for a community of 8000 to 9000 people. These lines, of course, are irrigation water lines and not water pressure distribution systems for homes.

Until 1951 the Bureau of Reclamation installed open distribution systems in which the flow of water was regulated by adjustments at the connections of the branch to the main lateral and at the connections of farm deliveries to the branches of sub-laterals. These are complicated and expensive adjustments when compared with closed pressure systems where regulation is made at the final delivery point only.

Mr. Mandry said that the initial cost of the full pressure distribution system was higher than that of the open system but that maintenance and

regulation costs made the average annual cost equal to or less than the open system.

He discussed cavitation across the valve area, explaining that neoprene coated surfaces offer protection in the vicinities. He explained the use of pressure gauges with a maximum operating pressure indicator as helpful in cutting down on water hammer. Water hammer, he explained, depends on pipe material, the distance between valves and the valves closing time.

Mr. Mandry said that until closed pressure systems were inaugurated, the joints were a limiting factor in concrete pipe systems, but that the use of modern rubber gaskets, pressure pipe and joints have eliminated this consideration.

### Control and Behavior of Concrete

Lewis H. Tuthill, Chief of the Concrete Laboratory at the Bureau of Reclamation spoke on "Some Aspects on Control and Behavior of Concrete." He explained the requirements of good concrete for pipe as being good strength, workmanship and permeability, resistance to abrasion, durability, toughness as opposed to brittleness and uniformity. He outlined the factors that increase strength of concrete; such as lower water-cement ratio, a favorable aggregate, minimum air entrainment and careful workmanship.

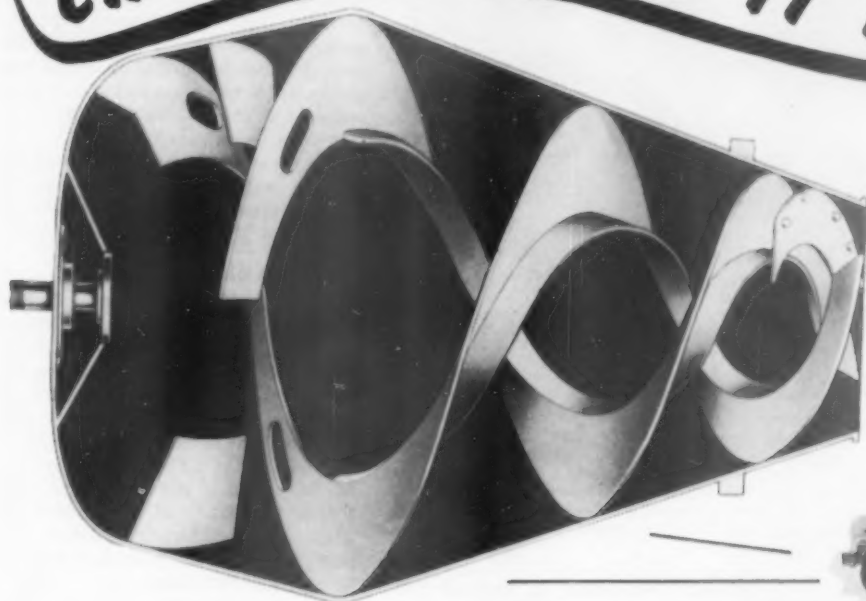
Under careful workmanship, Mr. Tuthill described the importance of supervision, condition of the forms being used, the use of workable and uniform concrete, means to assure effective consolidation and careful stripping and handling of the finished product.

He also discussed factors which reduce permeability in concrete such as effective consolidation, adequate curing and judicious use of admixtures. Resistance to abrasion is improved by



**Distinguished guests at convention.** Left to right: Lewis H. Tuthill, Chief of the Concrete Laboratory, U. S. Bureau of Reclamation; K. B. Keener, chief designing engineer, U.S.B.R.; Mrs. Keener; and Chris Dobbins, president, Ideal Cement Co.

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- ... the drum track is the largest in the industry, giving complete load support and positive, free turning action at all times?
- ... the "just right"  $16^\circ$  drum angle distributes the load over a larger mixing area giving both better mixed concrete and longer drum life?

The "heart" of any mixer is the drum... and no other mixer today can match the Challenge Pace-maker in design, ruggedness, operating efficiency, lower maintenance cost and longer service life.

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**Newly elected 1956 board of directors.** Left to right, seated: Homer Peterson, Rockite Silo Co., Hutchinson, Minn.; J. J. Seale, Concrete Conduit Co., Colton, Calif.; Bruce N. Spencer, Jr., Gifford-Hill-Western, Inc., Lubbock, Texas. Left to right, standing: G. D. Williamson, Valley Concrete Pipe and Products Co., Yuba City, Calif.; William B. Freeman, Lock Joint Pipe Co., Denver, Colo.; and Earl H. Eby, Elk River Concrete Products Co. of Montana, Helena, Mont. Missing from the picture are Glenn Harriman, Indiana Lock Joint Concrete Pipe Co., Lafayette, Ind.; and Charles E. Ward, Utah Concrete Pipe Co., Ogden, Utah.

all the factors which improve strength, and particularly by the use of good, hard, strong, coarse aggregate, said Mr. Tuthill. He touched briefly on the subject of resistance to sulfates which is accomplished by the use type V cement, by the use of extra cement, by low water-cement ratio, by drying the pipe after curing and by avoiding certain practices, such as reliance on extra type II cement or admixtures. He then briefly mentioned the alkali aggregate expansion problem and means to overcome it as well as resistance to freezing and thawing, toughness and uniformity.

Philip W. Manson of the University of Minnesota has recently been named chairman of a committee of A.S.T.M. to supervise and recommend revisions to specifications C118 for concrete irrigation pipe and C4 for concrete drain tile. Prof. Manson suggested that the committee incorporate provisions for C118 irrigation type of pipe used as drain tile in the same specification as the present C4 drain tile.

He mentioned the junction studies that have been made at the University of Minnesota which indicate that there is no greater hydraulic loss at a 90 deg. junction than there is at a 45 deg. junction when both lines are flowing full and at the same diameter. Prof. Manson suggested the use of a hydrostatic test to determine the quality of tile in addition to or in place of some of the present tests. He did not suggest breaking the tile by this means but

rather to determine its resistance to the passage of water under head. He suggested a standard quality drain tile and a special or superior quality tile for use under unusual conditions of exposure or load.

Prof. Manson showed results of tests on tile indicating that a 5-min. absorption test may be more significant than a 5 hr. boiling test because the immediate permeability of a tile rather than the long range permeability seems to determine its water tightness.

Mr. Quackenbush, irrigation engineer with the Soil Conservation Serv-

ice, urged cooperation between the American Concrete Agricultural Pipe Association and the Soil Conservation service engineers in the development of specifications for the installation of concrete irrigation pipe lines.

He explained that irrigation and drainage are both benefited by land leveling and conservation practices which are undertaken by S.C.S. This was the first of several meetings between S.C.S. engineers and A.C.A.P.A. manufacturers on the subject of a workable specification.

The new board of directors chose Denver as the site of the 1957 meeting of the Association sometime around the first of May.

### Concrete Block School

THE BESSER SCHOOL FOR BLOCK MAKERS AND BLOCK USERS met March 19-23, 1956, at the Besser Co. in Alpena, Mich., featuring a Materials and Methods Course, as well as three days devoted to the mechanical and electrical preventive maintenance of Besser equipment. The Materials and Methods Course include the following topics: Evaluation of Materials; Fineness Modulus; Sieve Analysis; Proportioning of Materials; Batching by Weight and by Volume; and Mixing.

Phases discussed on the mechanical maintenance of the Besser Vibrapac block machine included adjustment, front pallet feed assembly, feed box assembly, lubrication, miscellaneous assemblies, and preventive maintenance. The Besser mixer assembly was discussed, with special emphasis given to adjustments and maintenance, aligning mixer gear and pinion, and skip loader assembly. The mold assembly, vibrating shaft assembly, and Bes-Stone block splitter were also discussed.

The electrical phase featured the following topics: Safety and Handling of Electricity; Nomenclature of Parts and Breakdown of Units; Stearns Magnetic Brake; Warner Brake Control Unit (ICB); Jack Shaft Assembly with Warner Clutch and Brake Combination; V3M Electrical System; V3M Panel; V3R Electrical System; and V3R Panel. A lecture and demonstration of "Cubing" were presented by William Noggle, and a lecture, demonstration and discussion on "Concrete Masonry and its Proper Use" were given by Clem Mason, John Lapine and Paul Dave.



**Jerry J. Seale, right, new president of the American Concrete Agricultural Pipe Association, receiving congratulations of A. M. Herman, president in 1954 and 1955.**

KLEIST CONCRETE PRODUCTS, INC., has been incorporated in Eau Claire, Wis., with an authorized capital stock of 1000 shares of common at par value of \$100 per share. Incorporation papers were signed by Eugene G. Kleist of Eau Claire.

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I sincerely recommend the American No. 9 grinder -- it has certainly performed for us.

Yours very truly,

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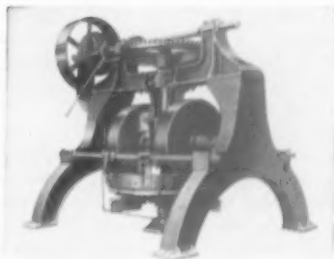
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For grinding cinders, haydite, pumice, slag, and quarry and mine products, American offers a complete line of grinders in eight sizes to meet all varying plant requirements. Their capacities range from 15 to 80 tons per hour.

If accurate grinding, in volume, poses a problem in your plant . . . ask for a non-obligating consultation with the "American Specialist" to take advantage of the years of experience he can offer you . . . write, wire or phone.

#### American No. 9 Grinder

This 30-yard capacity grinder has been designed to give big-volume aggregate production with a minimum of grinding costs. Mullers are adjustable to any height, and for finer grinding, the grinding surfaces run together.



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# Autoclave Producers Discuss One-Phase vs. Two-Phase Curing



Dale Cobb, president of A.B.P.A.

**S**OME ONE HUNDRED CONCRETE BLOCK MANUFACTURERS, members and guests of the Autoclave Building Products Association, attended the fiftieth annual convention in Detroit, April 22 to 25, at the Hotel Statler. The meeting was marked by intensely serious discussions of technical problems facing the industry.

It was the consensus of the members that the concrete masonry industry is quality minded as never before. They regard the lively discussions as evidence of an awakened interest in high pressure steam curing of concrete masonry units. They look for rapid growth in autoclave installations in plants of block manufacturers, both members and non-members of this vigorous association.

Convention visitors reaching Detroit on Sunday, April 22, were guests of the Detroit and Michigan members in the evening at a Fellowship and get-acquainted session.

In opening the business session, President Dale Cobb recounted the rapid increase in the use of concrete block from 1937. At that time he said 10 percent of new masonry wall construction was concrete block. In 1942 he said 50 percent of the walls were concrete masonry and 75 percent were concrete masonry in 1953.

"We must do more than merely produce block," President Cobb said. "We must have quality. We must look to quality if we are to stay in business."

Tracing the history of high pressure

• Annual convention of the Autoclave Building Products Association covers such vital subjects as construction controls, corrosion problem, binders of concrete block, and reverse rapid method of moisture testing

steam curing. Mr. Cobb said this curing method has been used in this country for many years, actually since 1902 for making sand-lime brick. The first concrete autoclave plant he said was built in Dayton, Ohio. Members of the Sand Lime Brick Association fostered the early developments. In 1948, Mr. Cobb said, the Sand-Lime Brick Association was reorganized and the name was changed to the Autoclave Building Products Association.

## Construction Controls

The first technical paper on the program was by C. A. Sirrine, an architect who is executive secretary of the Concrete Products Association of Michigan. His subject, "Construction Controls in Concrete Masonry Construction," was illustrated with detail drawings and slide pictures. He gave details of control joint procedure and horizontal wall reinforcement. One should never be used as a substitute for the other, he said. The speaker asserted that there is a definite need for control joints in concrete block walls because of the tendency to crack due to volumetric instability. He said that in the Detroit area, with an average relative humidity of 70 percent, 25 percent moisture content would be required in a block to be in equilibrium.

"There is some reluctance to talk about the cracking of walls," Mr. Sirrine said. "Some block men are like the ostrich."

Tests of ten types of aggregates available for making concrete block are currently being tested by the Michigan Concrete Products Association, the speaker said. He referred especially to the wide range of variation in temperatures to which structures within a 300-mile radius of Detroit are subjected. He said this range is from minus 30 deg. F. to plus 120 deg.

"It is important to watch construction practices," Mr. Sirrine said. "Block manufacturers are at the mercy of the

bad or indifferent practices of contractors. How materials are handled at the building site is important. What becomes of the moisture content of your block when it is left uncovered on the job site?"

Mr. Sirrine expressed the belief that there is keen interest in control joints and that such joints are coming into increased use. He said the procedure must be kept simple. In closing, the speaker declared that concrete masonry was making a fine contribution to the success of a big school construction program.

## One-Phase vs. Two-Phase Curing

Complete cost breakdowns of autoclave installations and accessories, data gathered during an engineering survey of the present status of autoclaving, were given by Cedric Willson, vice-president and chief engineer of Texas Industries, Inc. of Dallas. His paper on "Autoclave Installation and Economy of One-Phase Curing as Compared to Two-Phase Curing," presented figures that have rarely been made available.

Mr. Willson explained that there are two basic systems of high pressure steam curing. In the one-phase system the block remain on pallets in racks until the conclusion of the curing cycle. In the two-phase system the block are partially cured in a holding room and then cubed and placed in the autoclaves. Mr. Willson said there are many misconceptions about high pressure steam curing, much of which concern initial cost of plant and operating costs. He presented detailed figures showing costs of complete autoclave installations in hypothetical single-phase and two-phase, two-machine plants. He said that four installations would be required for the single-phase plant at a cost of \$138,000 plus \$32,800 for boilers. Two-phase operation of the same plant would need only two autoclaves at \$72,240 plus \$37,760 for

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Genuine Besser Parts are identically the same as the parts used for the original equipment. They are made to exactly the same high standards. They have to be. Otherwise your Vibrapac would not give you the high output of quality block and steady uninterrupted performance for which it is noted.

To insure quality control, Besser invested more than a million dollars in a Heat Treat Department. Quality control is impossible if the parts are "farmed out". As a result, Genuine Besser Parts fit perfectly, last longer, cost you less.

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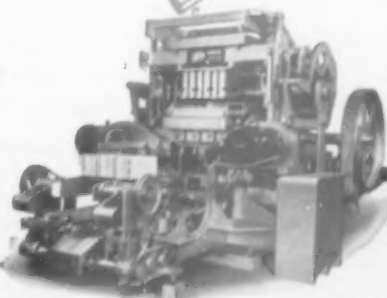
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This Lintelator can be equipped, at additional cost, with a concrete charging hopper to facilitate easy, rapid production.



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THE LYNCHBURG BLOCK AND CONCRETE ARTS

April 3, 1956

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Cuyahoga Falls, Ohio

Attention: Mr. Daniel Urban

Dear Sir:

Many thanks for the helpful service rendered by the Kent representative, Mr. Carl Worrell.

It might be worth something to someone to keep our experience with our Kent Lintelator. First, during this company's twenty years in business we have been making only block, concrete-type bricks and lintels. About three years ago we were forced to improve our lintel operation and came upon the Kent Lintelator.

Now after three years of continuous operation we give you one reason why you cannot get it back. One operator alone does and makes more than fifty lintels in an eight hour day on our Lintelator. These are better lintels - both true and good texture. This Kent Lintelator has practically no maintenance and our operator would never consent to reverting back to the old method of making lintels.

Needless to add, the Virginia Dunbrick Co., Inc. has found the Kent Lintelator a very good and most profitable addition giving us a stock of lintels to meet the demand.

In appreciation you may use this company as a reference and invite your prospects to visit here and see and talk with the Lintelator operator.

Very truly yours,  
VIRGINIA DUNBRICK CO., INC.

*A. Russell Sydnor*  
A. Russell Sydnor  
Sec., Treas.

**INVITE YOUR PROSPECTS TO VISIT HERE  
AND TALK WITH THE LINTELATOR OPERATOR**

You, too, can profit by the experience of Virginia Dunbrick Company.

A glance at their statement above is convincing proof that a Kent Lintelator is a definite money producing asset in any block plant today. Some plants have several in operation every working day.

You'll doubtless find a worthwhile market for lintels through the customers you are now selling.

Act now when the opportunity is "ripe" and ask us for the complete, interesting "Lintelator" story.

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LINTELS...  
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PRACTICALLY  
NO  
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WOULD NEVER  
CONSENT TO  
REVERTING BACK  
TO OLD METHOD  
OF MAKING  
LINTELS

A VERY GOOD  
AND MOST  
PROFITABLE  
ADDITION TO  
MEET THE DEMAND  
FOR LINTELS

boilers. He pointed out that although the initial cost of setting up a single phase plant is greater, savings in fuel and labor would retire the entire cost of the installation in three years. On the other hand, he said many years would be required to amortize the cost of the two-phase installation.

A discussion of the Masonry Code of the City of Detroit was led by Benjamin Wilk of Standard Building Materials. He sketched the growth of the block industry from the writing of the 1911 code to the present. In 1929, he said, an attempt was made to eliminate concrete block from the code. Now, he said, more than 40 million concrete block are made and used annually in the Detroit area. The rapid increase in the use of concrete masonry he said is due to the development of high production block machines.

Walter W. Horn, president of Cinder Block, Inc., Detroit, described the installation and operation of six autoclaves recently acquired for his plant at a cost of \$650,000. He said that several years of study and visits to many plants preceded the decision to convert the plant from low pressure to high pressure steam curing. The governing motive, he said, was a desire to make an economical block as free of defects as possible. Cinder Block, Inc., he said, was the first lightweight block plant in the Detroit area to install autoclaves.

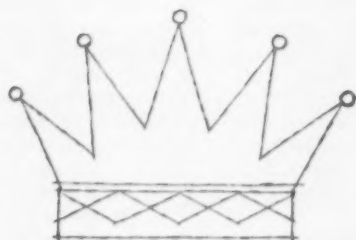
John Pennachetti, president Thorold Concrete Block, Ltd., of Thorold, Ontario, Canada, used colored slides in describing his company's two new autoclave installations in the Hamilton, Ont. plant. The plant is entirely new, he said, the installations being in new all-concrete buildings. "We have found much to learn," he said.

### Two Years of Autoclaving

Richard J. Frazier, general manager of Anchor Concrete Products, Inc., Buffalo, N. Y., who is a member of the N.C.M.A. Technical Problems Committee, followed with a noteworthy paper on "Two Years of Autoclaving at Anchor Concrete Products." He first told of his experience with another producer, curing block by the low pressure method. His observation with that company, he said, was that an increasing number of architects and engineers wanted autoclaved block. Since joining Anchor Concrete Products, he said; "I am convinced that proper application of mix design and manufacturing techniques, carefully combined with correct autoclave procedure will produce a product superior to any other."

The speaker said he was somewhat dismayed, however, to find that "al-

(Continued on page 242)



*for superb mixer performance*

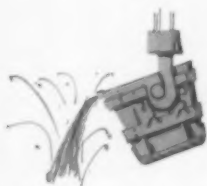
research



design



manufacturing



it takes all three

.....and you get them

with a



Performance—the only “real” yardstick when it comes to concrete and other dry material mixers—depends on three significant concepts of quality.

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Today Smith follows the goal of the founder just as it has for more than half a century: to build the finest quality products possible, without one single deviation in any detail.

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711 Industrial Road, Lufkin, Texas

Affiliated with Essick Manufacturing Company, Los Angeles, California

## AUTOCLAVE MEETING

(Continued from page 240)

though the physical properties of the finished product are excellent, the state of knowledge of the manufacturing techniques and equipment are far from exact. Many of the techniques in use today," he said, "are of very recent origin, in many cases less than two years old. In most instances they were developed the hard way, that is, by the trial and error method."

Mr. Frazier said that before the autoclave installations were made at Anchor, a considerable program of testing and development work was carried out. "From the beginning it was decided that two cycles a day was necessary," he said. "In a high production business like ours, a 24-hr. cycle for autoclave curing was inconsistent with our high production machines which turn over many thousands of times daily. The step from one cycle a day to two-cycle operation necessitated development of new techniques in curing."

"Prior to this time an autoclave cycle generally consisted of about 2 hr. filling time, 3 to 4 hr. setting time, 3 hr. to build up to 125-lb. pressure, 8 hr. holding at maximum pressure and 1 to 2 hr. for blowdown and unloading—for a total of between 17 and 19

hr. Investigation showed that setting time varied with the type of aggregate, (with less setting time required for lightweight aggregate units), and with type and quantity of admixture used in the unit. (The greater the cement replacement the longer the setting time required.) Failure to maintain sufficient setting time results in crazing of the block."

Mr. Frazier showed slides illustrating the phenomenon of crazing. In this connection he said: "A unit containing moisture at a relatively low temperature, when placed in an autoclave and steamed without first having been given the opportunity to develop a good set, will develop a multitude of longitudinal cracks along the top face shell and webs, resulting in a block that is wider at the top than at the bottom and also resulting in some reduction in compressive strength."

The speaker expressed the opinion that this crazing action is due to sudden expulsion of water as it is quickly turned to steam under the high temperature of the autoclave. He said if the block has first attained sufficient set to resist expansion forces the steam can escape without damage.

Mr. Frazier emphasized the facts that because a shortening of setting time was not feasible, it was necessary to develop a presetting procedure for

two-cycle a day operation. He described this presetting procedure in some detail. "It was found," the speaker said, "that by removing the green block from the block machine into an atmospheric pressure kiln, and using steam to gradually raise the temperature to 140 deg. F., that these units could be placed directly in the autoclave, without further setting time in from 2 to 4 hr., depending on the outside temperature, type of unit, and mix."

"Several advantages resulted from this process," Mr. Frazier said: "first, the filling of the autoclave was accomplished in 45 min. or less instead of having to wait 2 hr. for the block machine to produce sufficient racks to fill the autoclave; second, setting time was eliminated completely in the autoclave as this was accomplished in the presetting kilns; third, build-up time was reduced from 3 to 2½ hr. as the block were warmer when placed in the cylinder and the cylinder was not allowed to lose too much heat by cooling as it was open a much shorter period of time."

"In addition to these advantages," Mr. Frazier said, "it was found that by increasing the maximum pressure to 150 p.s.i., a 5-hr. holding period gave results equally as good as the results obtained in curing 8 hr. at 125

## Concrete Filler Block for *Fire-Safe* FLOORS and ROOFS

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Why not also apply these practical advantages to the floors and roofs? Concrete Filler Block, produced on a Besser Vibrapac, make it possible for the ENTIRE structure to be fire-safe and permanent... at LOW COST.



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Concrete Filler Block are made on a Besser Vibrapac... the same dependable machine that produces high quality concrete load bearing block for walls. And the same Plain Pallets are used. All types of filler block can be made in various sizes to coordinate with other modular materials and for all load conditions. Block plant operators can materially add to their profits by supplying their customers with BOTH wall and floor units. For further facts, contact your nearby Besser representative, or write:



Vibrapacs are versatile. They make ALL types and sizes of block on ONE set of Plain Pallets. Fully automatic. Off-bearer removes finished block with power hoist. No manual lifting.

**BESSER COMPANY • Complete Equipment for Concrete Block Plants • Alpena, Michigan, U. S. A.**

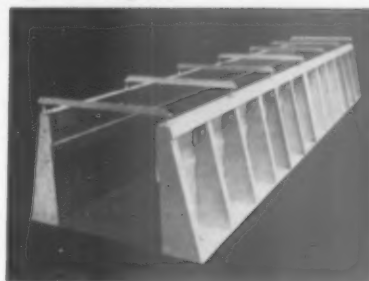
# PRESTRESSED CONCRETE BRIDGE BEAMS

## *in many sizes* WITH A SINGLE 300 to 400-FOOT INSTALLATION OF...



## *Now-mass production in a big way!*

The newest addition to the Form-Crete line (illustrated at the right) has been carefully engineered to provide the utmost flexibility for mass production of all sizes of rectangular bridge beams. Designed to withstand maximum operating and casting deflection loads the basic forms produce a rectangular beam 33 inches wide and 36 inches deep. Additional casting pallets are available in several widths and heights, enabling the manufacturer to cast all practical sizes of rectangular bridge beams utilizing the same single set of side forms. This economy feature, coupled with the uniform accuracy of all Form-Crete castings are but two of the many advantages that contribute to Form-Crete superiority. Investigate this new way to greater prestressed concrete product profits.



These Form-Crete rectangular bridge beam side forms and pallets are manufactured in 10-foot lengths for handling ease and are designed to produce a product that meets the demands of modern construction.

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CIMCO'S 2 or 3 bin plants move or set up quickly.



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Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

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## AUTOClave MEETING

(Continued from page 242)

p.s.i. We are able to produce a sound unit with the following cycle: 1/2 hr. venting to remove entrapped air; 2 1/2 hr. build-up time; 5 hr. holding at maximum pressure of 150 p.s.i. and 30 min. for blowdown; and allowing approximately 1 1/2 hr. to load and unload gives a total time of 10 hr."

"We have found this to be the very minimum cycle to be recommended," Mr. Frazier said, "and we wholeheartedly urge that the 2 1/2 hr. buildup and the 5-hr. holding period be not reduced below this minimum. Further reduction may endanger the strength of the unit and fail to adequately insure that a low shrinkage unit will be obtained."

The most serious problem in autoclave plants at the present time is corrosion of racks and cylinders, Mr. Frazier said. He showed slide pictures of the effects of corrosion and described various procedures taken to prevent or minimize corrosion. He said the Technical Problems Committee of N.C.M.A. has recognized the seriousness of the problem and has started a thorough investigation.

Paul Youngdahl, director of research of Mechanical Handling Systems, Inc., Detroit, spoke on "The Value of Automation for Meeting Rising Manufacturing Costs." The speaker pointed out that although the term automation is new, the general principles it represents are old and basic.

"Mechanization will simplify work, effect great saving and give better quality control," he said. "Half the cost of goods, he asserted, "is in handling from machine to machine in the conventional plant. All processes that do not add value to a product should be automatic."

### Panel Discussions

A panel discussion of the causes and possible means of preventing corrosion of kilns and equipment used in autoclaving, had the following panel members: Fred W. Reinhold, Anchor Concrete Products, Buffalo; E. W. Bauman, National Slag Association, Washington, D. C.; Carl A. Menzel, Portland Cement Association, Chicago and W. J. Brull, Duluth, Minn.

Another panel discussion was held on: "Design of an Efficient Autoclave Curing System." Panel members were: A. E. Grann, Mechanical Handling Systems, Inc., Detroit; Morris H. Gross, consulting engineer, Detroit; Robert W. Molley, Anchor Pressure Doors, Inc., Buffalo, N.Y.; D. W. Tappan of McMamar Boiler & Tank Co., Tulsa, Okla., and John K. Selden, consultant on autoclaving, Toledo, O.

In introducing the panel discussion President Cobb called attention to plans for publishing a map showing the location of autoclave plants. Members were asked to fill out forms which were available for distribution at the speakers' table.

Mr. Selden, who led off the discussion, said there are six types of efficiency in autoclaving: (1) efficient use of space; (2) mechanical efficiency; (3) efficient cycling; (4) thermal efficiency; (5) efficient use of cementitious material; (6) paste efficiency. By the use of racks contoured to fit the kilns, it is possible to double the output through space saving. The increased efficiency through better handling of block, he said, was obvious. In explaining what he called efficient cycling, Mr. Selden said the term assumed as many curing cycles as possible in any given period of time. He said it should be remembered that an autoclave is not storage space but a valuable means of production. He said that systematic means of charging and discharging are essentials. He expressed the belief that by preheating and faster charging, three cycles a day could be run. Block, he said, should be cast warm and kept warm from the block machine to the kiln. Thermal efficiency is improved, he said, by a lot of block in a small space. He suggested that condensate from the autoclave could be used for mixing and that blowdown steam could be used for preheating block in a precuring tunnel. He said block plants should have a hot well or accumulator for blow-off steam. The speaker explained that his reference to efficiency in the use of cementitious materials implied that some of the cement in the mix could be replaced by silica flour or lime.

Mr. Molley urged careful advance study of market potentials for high pressure cured block before installing autoclaves. "Keep the old plant," he said "and let the new plant carry itself."

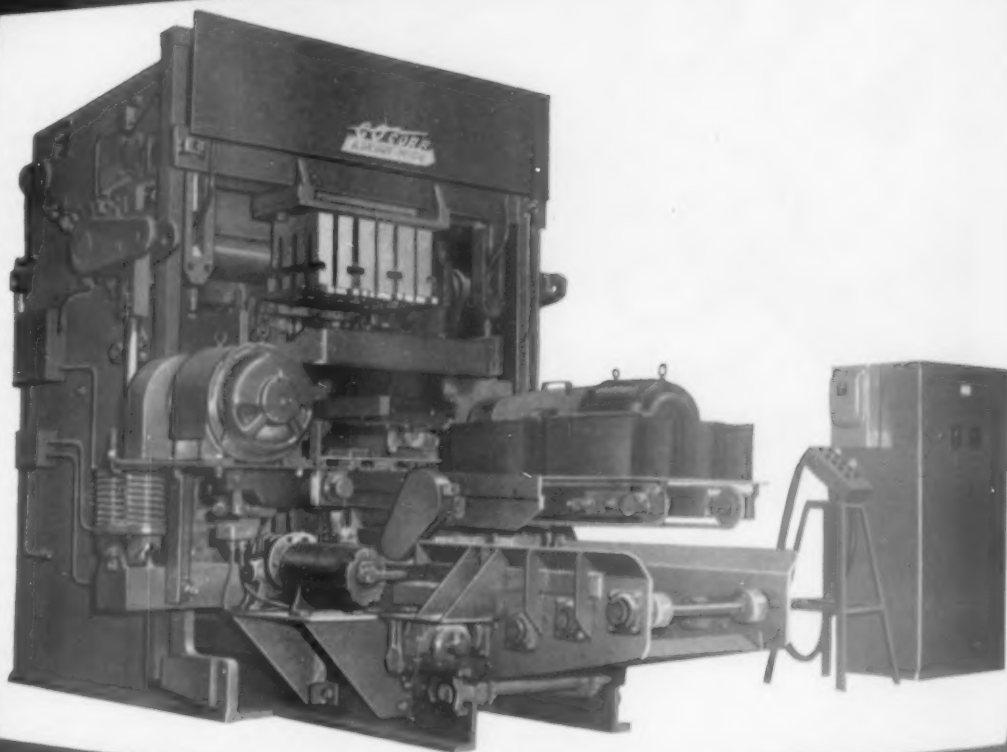
Mr. Selden's remarks provoked a lively discussion from the floor. C. A. Menzel, concrete technical problems consultant of the Portland Cement Association was emphatic in his declaration that quality production cannot be obtained with three autoclave cycles a day. "It is very questionable," Mr. Menzel said, "whether a stable block can be produced by the use of three cycles a day of high pressure steam curing." He emphasized the advantages of using pressure and temperature recorders in order to have proper control of autoclaving. Both Mr. Menzel and Cedric Willson, vice-president and chief engineer of Texas Industries, Dallas, Texas, pointed out that temper-

(Continued on page 246)

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NO DRAWING BOARD DREAM BUT THOROUGHLY FIELD TESTED—THE GOCORP, 3 at a time, PLAIN PALLET, "TRUSTEE" IS READY TO GO TO WORK FOR YOU NOW!

### CONSIDER THESE FACTS!!!

- HIGHER PRODUCTION—Up to 1100 good blocks per hour, with many aggregates, without abusing the machine.
- TOP QUALITY BLOCKS—Fewer culls in production • Fewer rejects on the job • Variable cycle—for complete flexibility and constant control of quality • Accurate height control.
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- QUICK MOLD CHANGE—Change full height molds in about 20 minutes—to other heights in about 30.
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- NO BRAKE FAILURE—"Trustee" vibrator motors are 10 HP plug reversing type • Designed for frequent stops and starts • No brakes to cause trouble.

The "Trustee" will accommodate, without alteration, molds of the majority of plain pallet machines now in use. You can have all the advantages of the modern hydraulic "Trustee" and protect your mold investment tool

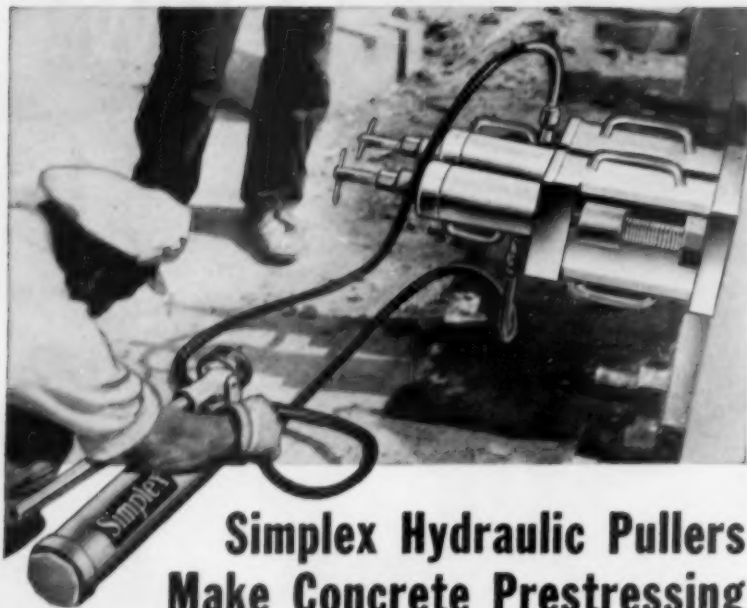
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Simplex "Re-Mo-Trol" units consist of a "center-hole" pulling hydraulic ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated from any nearby convenient location.

"Re-Mo-Trol" hydraulic pullers are ideally suited for prestressing

operations. Whether you operate full-time permanent pre-tensioning beds or have only an occasional call for stressed structural units, Simplex offers a model for your express needs. These versatile Simplex units are available in standard capacities from 10 to 100 tons, and can be used directly on cables, rods or wires for heavy tonnage high-pressure tensioning or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

For detailed data on the selection and application of "Re-Mo-Trol" Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



**SIMPLEX "RE-MO-TROL"**—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

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ature is more important than pressure in curing block.

C. W. Bros of Wm. Bros Boiler & Manufacturing Co., Minneapolis, made a strong plea for the use of temperature and pressure recorders. "You are operating blind without them," he said. He expressed the belief that emphasis should be on temperature rather than pressure.

W. E. Kenney, of the Siporex Division, Dominion Tar & Chemical Co., Montreal, Canada, described the operation of Dominion's Siporex plant in Montreal. He showed colored motion pictures illustrating the manufacture and use of Siporex in Sweden.

A visit was made by members to the plant of Cinder Block, Inc., 9143 Hubbell Ave., Detroit. The trip was personally conducted by Walter W. Horn, Cinder Block's president. At the plant the more than 75 association members and guests saw six recently installed autoclaves in operation. The trip was made in chartered motor buses.

Because of high interest in the work of the convention, an evening session was held Tuesday when Neal Newell, plant manager, Grays Ferry Brick Co., Conshohocken, Penn., described the manufacture of sand-lime brick in various pastel colors. His paper was illustrated with colored slides showing processes of manufacture and application of sand-lime brick in residential construction.

M. W. Ferguson, president Pre-Shrunk, Inc., Roanoke, Va., presided over the final session. "Cost Management for Operating Profits," was the subject of a paper by Gerson B. Bernstein, consulting engineer with Allied Management Engineering Co., of Detroit. "Good principles apply equally well to autoclaving or any other manufacturing operation," Mr. Bernstein said. "It should be remembered that accounting records are historical. They tell what has already happened not what is happening or why." He emphasized especially the importance of what he called proper management tools. These he said, should be: (1) standards or a yardstick by which to measure the results you should be obtaining; (2) budgets or a preplanning of procedure; (3) operating statistics; (4) comparison of standard results to what you have actually done. These things, the speaker said, are applicable to any large or small business. He emphasized the extreme importance of a preventive maintenance program.

Mr. Ferguson, who was presiding, was scheduled to deliver a paper on "Evaluation of a Specification for Distinguishing Quality Merits of Autoclave Cured versus Conventionally Cured

(Continued on page 249)

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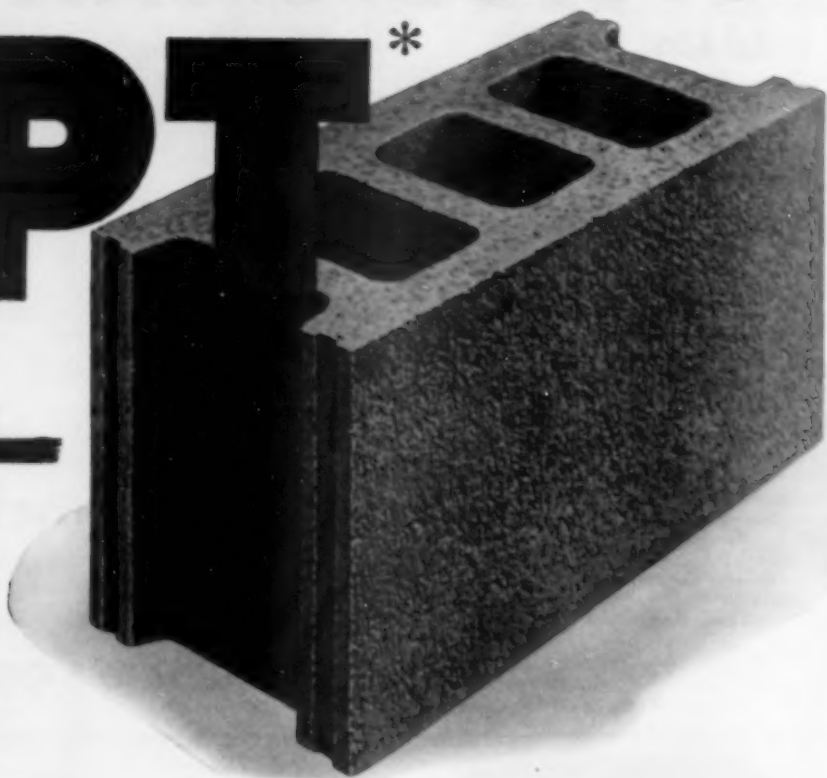
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As white as snow  
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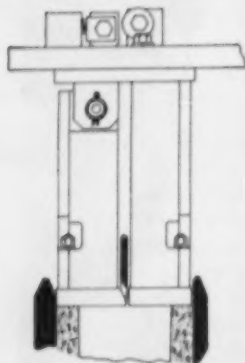
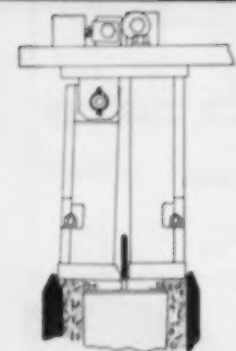


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U.P.T. attachments are available in 3 core, 2 core and floor & roof filler block. Get all the facts from your Besser representative, or write:



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Lower drawing shows swinging stripper shoe—after clearing higher core plate — and contacting stationary shoe — ready to strip U.P.T. block.



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## AUTOCLAVE MEETING

(Continued from page 246)

Concrete Masonry Units." Mr. Ferguson said he intended to talk on how to tell when a block is properly cured. He asserted that many autoclaves have been installed for no better reason than that somebody else had one. He then explained that before he made any further comments he wanted the members to hear a paper by C. W. Smith, associate professor of applied mechanics at Virginia Polytechnic Institute, Blacksburg, Va. Prof. Smith's paper was titled, "Test Results by the Reverse Rapid Method." He described moisture-volume change tests on a variety of concrete masonry units.

At the start Prof. Smith explained that in a sense there are only two types of concrete block—those that will crack and those that will not. The so-called "reverse rapid method" of testing involves first drying the block and then saturating them to a constant weight for 48 hr. Prof. Smith described tests made in the laboratory of Pre-Shrunk, Inc. on block first cured in low pressure steam, autoclaved and then tested. He showed slides of tests on 19 different specimens, including block made with shale, slag, limestone and cinder aggregates. Other slides shown were on thermal movement, moisture movement and total change on shale aggregate block.

As a background for Prof. Smith's paper and his own remarks, Mr. Ferguson displayed a graph 40-ft. long by 4-ft. high which showed the volume change in five different block for 202 days. After 117 days all the block leveled out with no further changes. Two of the block were cured in high pressure steam and the others were steam cured at atmospheric pressure.

Prof. Smith's paper and Mr. Ferguson's remarks sparked a lively discussion on the floor. Dr. W. C. Hansen, Research Director of Universal Atlas Cement Co., urged block manufacturers to make all possible tests of high pressure cured block as an aid to providing data on which to base specifications for autoclaved block. Dr. Hansen is chairman of ACI Committee 716 on High Pressure Steam Curing. This committee held a closed session at the conclusion of the autoclave meeting.

As a part of the discussion of Prof. Smith's paper, C. A. Menzel, Portland Cement Association, urged the adoption of an adequate high pressure curing cycle by the entire industry to insure stability of block.

The final feature of the session was a highly technical paper by Dr. George L. Kalousek on "The Crystal Nature

(Continued on page 254)

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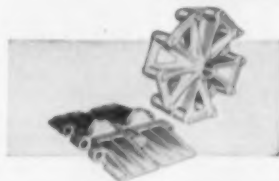
Busy BANTAM owner Weldon Laurence of Weldon Laurence & Sons, Prophetstown, Illinois, is talking from experience about a BANTAM's bigger payoff. He formerly owned a larger dragline, too cumbersome, too costly to operate and maintain for his work—excavating gravel from a river bed into stockpile and truck loading it . . . as well as other digging jobs, Laurence switched to the low-cost BANTAM method.

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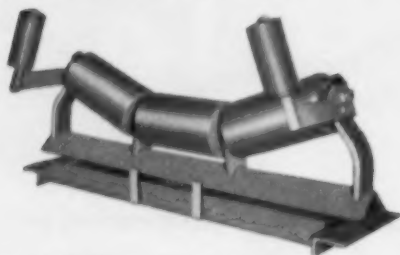
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Each idler has an all-steel frame with a self shedding base that prevents material build-up.

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These are the facts. And they all add up to the sound proof that MARCO offers you perhaps the finest, most complete line of ball bearing idlers available to American industry today.

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- Tubular Frame Belt Conveyors
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### INFORMATION FILE HOW TO OPERATE PROFITABLY

See  
**ROCK PRODUCTS**  
Table of Contents Page.  
There is probably a story of interest and profit to you!

### RADIO

(Continued from page 224)

trucks can be shuttled between yards. Overtime has been reduced and afternoon jobs finished earlier. Contractors are especially enthusiastic about radio communication because they can change specifications on a mix as a job progresses with no waste of time.

Mr. Steele commented especially on the fact that the mobile units operate satisfactorily on Group 4 batteries without the use of heavy duty generators or truck batteries.

As might be expected in an installation especially designed to fit local conditions, receivers and transmitters in the various Hilltop plants are not all the same. In the Price Hill and St. Bernard plants a handset and stand provides both transmitter and receiver in a single compact unit. This unit is known as Model CC-9A.

Trucks operating in Cincinnati are equipped with the R.C.A. Carfone 250 Mobile FM radio. This unit operates from the truck battery. It is operated from a dash-mounted control with an elliptical loudspeaker and palm-type microphone. Separate transmitter, receiver and power supply are assembled in a drawer-type case.

The unit installed in the Bevis, East End and North College Hill plants is known as the Carfone 450, FM Station, Desk Mount.

Antenna used at all the base stations is known as CA-1A, non-directional. It is especially designed for communication with mobile units.

The transmitters used at the Hamilton and Dayton plants are known as the Fleetfone Station Console, Type CSF-60A. These units are designed for fixed stations operating in the 30-



Vernon Bernhardt, driver, talking to Bevis plant by two-way radio

## **BES-STONE** Split Block *MAKES the Difference*

\* **Advances architectural design and beauty**

\* **BOOSTS YOUR PROFITS!**

**+ Add a BES-STONE  
BLOCK SPLITTER  
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*the Split Block  
with Character*



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18" and 24"

Automatic operation —  
960 Split Block per Hour

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from foundations  
to sidewalks

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*Corporation*

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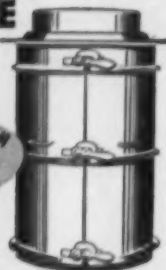
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Nozareth, Pa.

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BOONE, IOWA

## WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

SEE THE  
**"WHERE TO BUY"**  
SECTION

## RADIO

(Continued from page 250)

50 megacycle band. Each unit is a complete 60-watt transmitter-receiver and power supply mounted in a single compact case.

The two-way transmitting and receiving equipment installed in the trucks operating in Hamilton and Dayton is a Fleetfone Mobile FM radio, Type CMV-2, 30 watts, operating on 30-50 megacycles. Power comes from the truck battery.

About three-fourths of Hilltop's large fleet of trucks have mixer ratings of 5 cu. yd. The remainder are 3-cu. yd. Most of the larger units are Smith

high-dumps. Others are Jaeger, Rex and Blaw-Knox. Hilltop has standardized on Mack B42, ten-wheel tandem drive chassis. All trucks are painted a brilliant red and green and are maintained in spotless condition. For years Hilltop has used its well-cared for trucks as an effective form of advertising, as it is now doing with its efficient radio system.

Officers of Hilltop Building Materials, Inc. are: I.W. Steele, chairman of the board; Charles O. Dittich, president; John F. Steele, executive vice-president; Thomas D. Harrington, vice-president, operations; H. Paul Pitzer, treasurer and Mrs. I.W. Steele, secretary.

## Unit Heaters Cut Curing Cost

UNIT HEATERS have been used very successfully to reduce costs of curing concrete products at the Springfield, Ill., plant of Standard Concrete Co. Of the six kilns where unit heaters are installed, four are used for curing pipe, one for concrete block, and one for various special items produced at the plant. A 24-hr. time cycle is used in curing the block, while the pipe remain in the kilns for at least 72 hr.

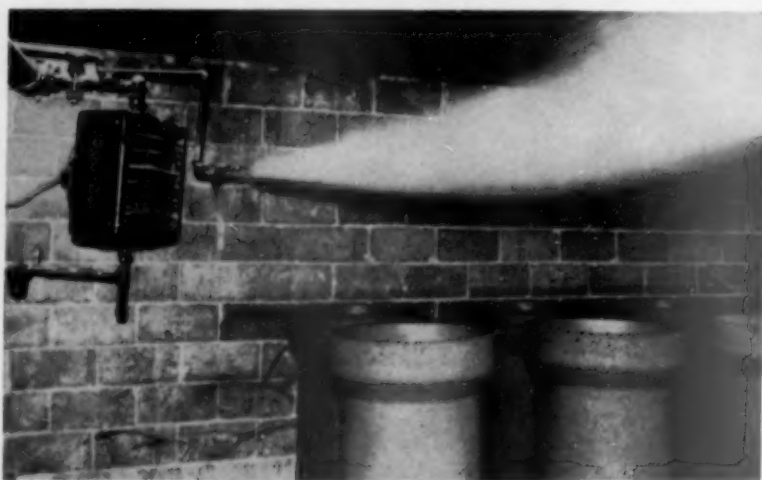
The heaters are horizontal delivery units, with steam supplied to them from a stoker-fired, low-pressure boiler. This boiler also supplies steam to jets which discharge at the face of each unit. This arrangement maintains a constant temperature of 95 deg. F., and a near-saturation condition. Steam is turned off on completion of the heating cycle, but the unit heater fans are left on to continue air circulation until the kilns are unloaded.

At the time the unit heaters were first installed, it was thought that the

kiln temperatures would have to be kept between 110 and 130 deg. F. This would have required cooling of the heater motors. However, not long after operations began, it was found that sufficiently rapid curing could be obtained at a 95 deg. F. temperature level. This eliminated the necessity for cooling the motors.

As is evident from the illustration, a unit heater takes up very little room in each of the kilns. Each unit has been located away from the floor and close to the wall where workmen will not come in contact with the units and consequently receive injurious burns. The Standard Concrete Co. reports that these heaters have operated dependably and virtually trouble-free since they were installed.

Maintenance and initial installation of these units at the Standard plant cost relatively little. Because every unit is able to supply the needed steam directly to the area where it is needed,



Horizontal discharge unit heaters with steam jets maintain constant 95- deg. temperature in the curing room

# IT THRIVES ON HARD WORK

*Columbia's*  
**MODEL 8**

## **BLOCK MACHINE**

There's lifetime durability in every inch of Columbia's Model 8. It's a tough, dependable heavy duty machine—built for continuous year-after-year service...

### *And Here's* **WHY!**

Highest quality material! Extra built-in strength factor to guard against breakage or distortion. Solid, heavy welded plate frame.

Fewer moving parts! No cams, levers, gears, belts, pulleys, gear head motors, shear pins, etc.

All parts completely covered! Sealed, oversized bearings insure longer life.

Automatic operation requires minimum operator attention! Complete cycle in 10 seconds when making 4-inch high block... 15 seconds or faster when making 8-inch high units.

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*Columbia* **MODEL 8**  
Columbia's Model 8 including: Pallet feeder, mold, feed box agitator, electronic controls and panel, all motors and switches, pumping unit and electronic height and density control.

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for — TOP QUALITY CONCRETE — *always*  
EXACTLY TO SPECIFICATIONS

## ECONOMICAL, INSTANTANEOUS, AUTOMATIC AND ACCURATE

Wherever it is necessary to know the actual exact percentage of surface moisture in a sand or aggregate batch, the C & W Electronic Moisture Meter is a needed tool. The meter enables the batcher to completely control the water content of all batches regardless of variation. Percent of moisture content is instantly registered on the direct reading scale.

### WHAT IS IT?

The C & W Electronic Moisture Meter is a newly-developed precision instrument, scientifically designed, and built for years of service. It operates on the principle of conductivity of water to indicate the exact surface moisture content of material in a hopper. Changes are automatically shown.

### WHAT DOES IT DO?

It does away with trial-and-error methods, cutting wet load rejects and losses. It permits the production of uniform batches of consistent slump concrete. By instantly registering exact moisture content in the weigh hopper, the meter permits complete control of batching regardless of changes in the wetness of the sand and aggregates.

### WHY IS THIS NECESSARY

Mainly to eliminate guess-work from the production of specified quality concrete mixes. The batcher becomes the master because he knows what changes he must make to meet the specification. Every batch exactly to design strength without waste of materials or time.



Write For Complete Information

## C & W SALES CO., INC.

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Telephone: Davenport: 2-5416



there is no waste or time lost. This is said to save the plant a considerable amount of money annually on fuel alone.

## AUTOClave MEETING

(Continued from page 249)

of the Binders of Concrete Block." Dr. Kalousek is chief of physical chemistry and solid state physics at Owens-Illinois Technical Center, Toledo, O. His paper dealt chiefly with the morphology of lime, silica and alumina. He showed slides derived from studies with an electron microscope, of certain closely related crystalline compounds having a low shrinkage. One of these, which he said was newly discovered and hence bearing a new name, is called tobermorite. He said this was a new synthesis of hydro-calcium silicate.

Dale Cobb, sales manager, Jackson Ready-Mix Concrete, Jackson, Miss., was reelected president of the Autoclave Association for the 1956-1957 term. Leo J. Ryan, of Ryan Builders' Supplies, Ltd., Windsor, Ont., was reelected vice-president. Ralph E. Cromis, president of Boice Builders' Supply, Pontiac, Mich., was elected secretary-treasurer to succeed Henry de Geus II, manager Saginaw Brick Co., Saginaw, Mich. M. W. Ferguson of Roanoke, Va. was reelected chairman of the concrete products committee.

President Cobb announced that members of the Association had approved a plan to employ a paid secretary. Until the present time, he said, the Association's work had been carried on by members who have volunteered their services, often at considerable personal sacrifice. The next convention Mr. Cobb said, will be held in January, 1957 at a place not yet selected.

## Plastic Cell Concrete

A LIGHTWEIGHT CONCRETE containing plastic lined air cells that act to insulate, repel moisture and deaden sound, was announced by Reflectal Corp., Chicago, Ill., architectural products subsidiary of Borg-Warner Corp. The concrete material, known as Beto-cel, consists of sand, cement and water, and a special bubble-forming emulsion developed in Europe by a Belgian inventor, Willi Jules Cohnen. Its primary use has been in wet poured roofs and floors and insulation fills. Weight can be controlled at between 18 and 75 lb. per cu. ft., according to the company. The wet material has the consistency of heavy malted milk and can be leveled off with one pass; in precast forms, it can be painted, plastered, tiled, stuccoed, sawed and nailed.

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ABC CIRCULATION  
AND HIGHEST  
RENEWAL PERCENTAGE  
IN THE  
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Automatic Hydraulic Chute Operation



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no loss—no fuss

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The mortar can be made to match the color of the block by using the same pigment.

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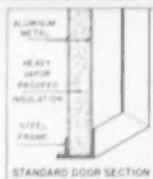
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WHERE HINGE-TYPE DOORS ARE PREFERRED Choose from two STANDARD hinge-type doors. The top-hinging door (shown) can be used when there's insufficient room at sides of door. The conventional side-hinging door has rugged hinges and positive-seal lock.

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1-man operation . . . hydraulic movements . . . electrical controls. 2 1/4 tons of machine self-contained to occupy only 33 square feet of floor space.

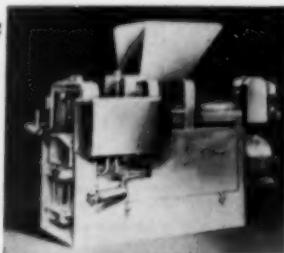
Korpak machines are available on sale or lease-purchase. Write for descriptive catalog.



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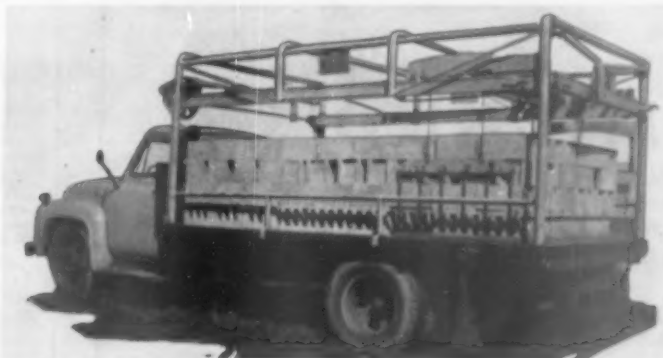
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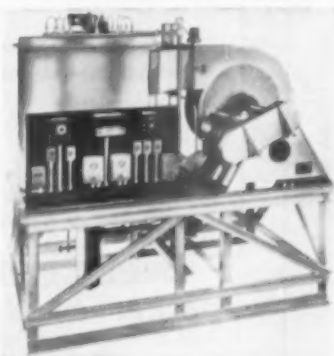
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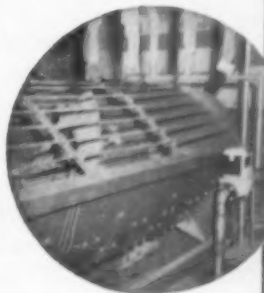
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#7 & 9 ..... 250.00 each  
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100—Racks for cored steel

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4½ High Dump Smith truck mixer mounted on K 11 International tandem truck, in daily operation, the truck is too heavy for roads in our section, can not haul five yards.

**GILESPIE STONE CO.**  
Bluefield, Virginia

### LOWER COST

**packer-head wings**  
Proved to last as long or longer—yet cost considerably less. Write for prices.

**TEXAS FOUNDRIES**  
LUFKIN, TEXAS

### DID YOU BENEFIT FROM SOMETHING YOU READ IN "ROCK PRODUCTS"

Elsewhere in this issue is a special card to make it easy to subscribe for a friend or employee.

Why not pass along the card to people you think should be reading **ROCK PRODUCTS** every month.

For sale—where is and as is—complete ready-mix plant consisting of the following:

- 1—Butler Cement Plant, 600 barrel capacity, with under-track screw conveyor and bucket elevator.
- 1—40 H.P. Kewanee Oil-fired Boiler, complete with oil-storage tank and water-storage tank.
- 1—200-gallon per minute Automatic Liquid Meter Company water weigh batcher.
- 1—3-compartment Blaw-Knox Aggregate Bin with collecting hopper and three beam scales; top beam 8000 pounds, both remaining beams, 5000 pound capacity.
- 1—Blaw-Knox 200-gallon per minute automatic water weigh batcher.
- 1—Johnson 2-compartment Aggregate Bin with clamshell gate, but no hopper or scale.

Price of complete unit—\$19,350.00

Available Immediately—Rail Facilities on Site.

- 11—3-cubic yard truck mixer units (5 Smith and 6 Rex), some mounted and some unmounted. Spare engines. Prices available upon request.

Equipment available for inspection at:

**Fruin-Colnon Contracting Co.**  
2000 St. Clair Avenue  
East St. Louis, Illinois

All of above listed items subject to prior sale.  
Terms cash.

### 50 TRUCK MIXERS

**JAEGER, REX, SMITH**

High Discharge, Horizontal  
In Stock

From \$500 Up

**THE JAEGER-LEMO  
MACHINE CORP.**

Northern Boulevard at 127th Street  
Corona 68, New York—Hickory 6-8800

### FOR SALE

- 1 Toledo Print weight scale—4000 pound capacity 2 pound graduations. New. Any reasonable offer will be accepted.

**WILLIAM MASCANTONIO, Purchasing Agent**  
**PLASTICRETE CORPORATION**  
1883 Dixwell Ave. Hamden, Conn.

### WANTED URGENTLY

**DUNBRIK MACHINE, Pallets and Racks.** Condition no objection. Extra racks also required.

BOX O-36,

**CONCRETE PRODUCTS**

79 W. Monroe St. Chicago 3, Ill.

### WANTED

- 6" Cored steel pallets code "CABIN".
- 8" Cored steel pallets code "DISARM".

State quantity, condition and price

**WORTHINGTON BLOCK  
& BUILDERS SUPPLY**

R#1 Phone 2-4311 Worthington, Minn.

### HELP WANTED

**SUPERINTENDENT FOR CONCRETE PRODUCTS PLANT. TOP NOTCH MAN, MASTER MECHANICS BACKGROUND. SALARY IN FIVE FIGURES. COMPLETE RESUME IN FIRST REPLY.**  
BOX O-35, CONCRETE PRODUCTS  
79 W. Monroe St. Chicago 3, Ill.

### WANTED

Concrete Products Plant Superintendent, Civil Engineer or Mechanical experience required. Latest Beaver Equipment, Jolt Plant and Precast Units, Beams and Columns. Salary commensurate with ability—Pension and Profit Sharing Plan.

**FOSTER BUILDERS SUPPLY CO.**  
P.O. Box 535, 10th & Water Sts.  
Port Huron, Michigan

### FOR SALE

#### COMPLETE READY-MIX PLANT

Western Illinois town—Population 6,000—14,000 yards annually. 5 years old—Latest type bins—Bulk Cement—4 mixers like new. Complete Block Plant.

Total set-up is winterized. New buildings. Office and Warehouse. Reason for selling—other interests.

BOX O-31, CONCRETE PRODUCTS

79 W. Monroe St.

Chicago 3, Ill.

## COLORS

For Cement  
and Concrete

COLOR YOUR CONCRETE WITH LANSO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:

**Landers-Segal Color Co.**

73 Delavan Bldg.

Brooklyn 31, N. Y.

## GOOD WILL BUILDERS

Your contractor and bricklayer customers will be able to do quicker, easier, straighter work with UB Tools . . . tools that carry **YOUR OWN COMPANY ADVERTISING**. Linestretchers, Corner Ties, Line Pins, Twigs, Concrete Calculators. We also wholesale a complete line of Blocklayers' Tools. Write for literature and prices.

**UNITED BUILDERS**

1829 Lindberg Dr., Muskegon, Mich.

Pallets  
Racks  
Lift Trucks  
Block  
Machinery

**WITTEMAN MACHINERY COMPANY**  
FARMINGDALE, NEW JERSEY

Specialists in Concrete Products Equipment

Eastern Representatives of the

**COLUMBIA MACHINE WORKS, Vancouver, Washington**

Elevators  
Bins  
Conveyors  
Feeders  
Mixers

### CONCRETE BRICK COLORS CEMENT COLORS MORTAR COLORS

made by

**BLUE RIDGE TALK CO., INC.**  
Henry, Virginia

### FOR SALE

Fork and platform power lift trucks, used and guaranteed factory rebuilds.

**ERICKSON POWER LIFT TRUCKS, INC.**

Saint Anthony Blvd. & University Ave. N.E.  
MINNEAPOLIS 18, MINNESOTA

Phone—Sterling 1-9508

### FOR SALE

**89 JOLT CRETE—4 AT A TIME**

4000 8" Equiv. A. DAY Excellent condition. 8" & 12" attachments with approx. 4000 8" & 2700 12" pallets. Approx. 100 Chase block cars, transfer cars, rail and turntable. Many spare parts for machine included. ALSO a complete drag line with 75 H.P. motor.

**WASSAU CONCRETE PRODUCTS CO., INC.**  
P. O. Box 4 No. Baldwin, L.I., N.Y.

### FOR SALE

**PRECAST PLANT** established 1946. Good agricultural and industrial town of 12,000 near Ken-tucky Lake. Manufacturing septic tanks, drain tile, shingle blocks and dozens of other precast items. No real estate. Reasonable rent. Electric heat. Monorail delivery truck. Total cash price of \$12,500.00 includes all concrete equipment and yard stock which usually runs around \$7,000.00.

Box O-38, CONCRETE PRODUCTS  
79 W. Monroe St. Chicago 3, Ill.

### FOR SALE

Complete Block plant now in operation, and own gravel and sand pits, in Wisc. Reason for selling, other interests. Write to:

BOX O-34, CONCRETE PRODUCTS

79 W. Monroe St.

Chicago 3, Ill.

COMPLETE STEEL FORM AND MAST EQUIPMENT FOR BUILDING CYLINDRICAL CONCRETE BINS, SILOS AND OTHER ROUND STORAGE STRUCTURES.

Used "Polk System Senior" equipment (well greased and stored dry) in excellent condition ready for use. Builds walls 6" to 8" or 9" thick any height desired. Diameter sizes from 12' to 30'. Priced right. A bargain for work of its kind. Write, Phone, Wire or Call:

**CRAINE, INC.**

SHELDON ST.

NORWICH, N.Y.

### FOR SALE

Stearns magnetic off-bearer complete with boom, new and unused magnetic fingers, and new and unused rectifier. Also, Stearns pallet return completely reconditioned and never used. Both in excellent condition.

**Rock Hill Concrete Co., Inc.**

P.O. Box 939 Fairfield St. Rock Hill, S.C.

### BELT CONVEYOR FOR SALE

One 60' Portable Belt Conveyor 18" style N Barber Green Pneumatic Tires 5 H.P. Electric Motor.

**NATIONAL CEMENT PRODUCTS CO.**

2930 Wayne Street at Terminal R.R.  
Toledo 14, Ohio

### FOR SALE

I used bergin pallet cleaner in good condition. Will be sold completely rebuilt or as is. Any reasonable offer will be accepted.

**WILLIAM MASCANTONIO, Purchasing Agent**  
**PLASTICRETE CORPORATION**  
1883 Dixwell Ave. Hamden, Conn.

# YOU LIKED THE truck-man 40



## BUT THE Y-40 IS EVEN BETTER!

We took your suggestions and reworked the Model 40 into a vastly improved truck, the Y-40. The 40 was designed for block handling. The Y-40 is your improvement.

**NEW**—Rigid mast fabricated of channels rolled especially for lift trucks—built to last indefinitely.

**NEW**—Transmission has four speeds, forward or reverse. Speeds to 20 mph in either direction • Saves time and turnarounds on long or short hauls.

**NEW**—Narrow or wide drive axles with single or dual wheels • A combination to fit any conditions.

**NEW**—7.50 x 15, 10 ply Road Lug pneumatics on the drive and 6.00 x 9, 10 ply pneumatics on the rear assure maximum traction and footing.

**NEW**—Power steering at small extra cost.

### PLENTY OF OTHER IMPROVEMENTS TOO

But we kept the features that made the 40 outstanding

- Powerful 4 cylinder Ford Industrial valve-in-head engine
- Oversized clutch
- Timken-Detroit drive axle
- Honed hydraulic cylinders
- Welded frame
- Forks



in many sizes and styles and special attachments for bulk materials and awkward pieces • Plenty of free lift for working in kilns • Tilting mast and optional side shifter for effortless cubing

- Ample underclearance for humps and bumps
- Ready accessibility to all wear parts.

For paved yards or indoor work, ask about the new two ton Model W-40.

WRITE TODAY FOR FURTHER INFORMATION ON EITHER OR BOTH OF THESE NEW TRUCKS, EVEN WITH THESE EXTRA FEATURES TRUCK-MAN COSTS LESS

**truck-man**

DIV. OF THE KNICKERBOCKER CO.

650 LIBERTY ST., JACKSON, MICHIGAN

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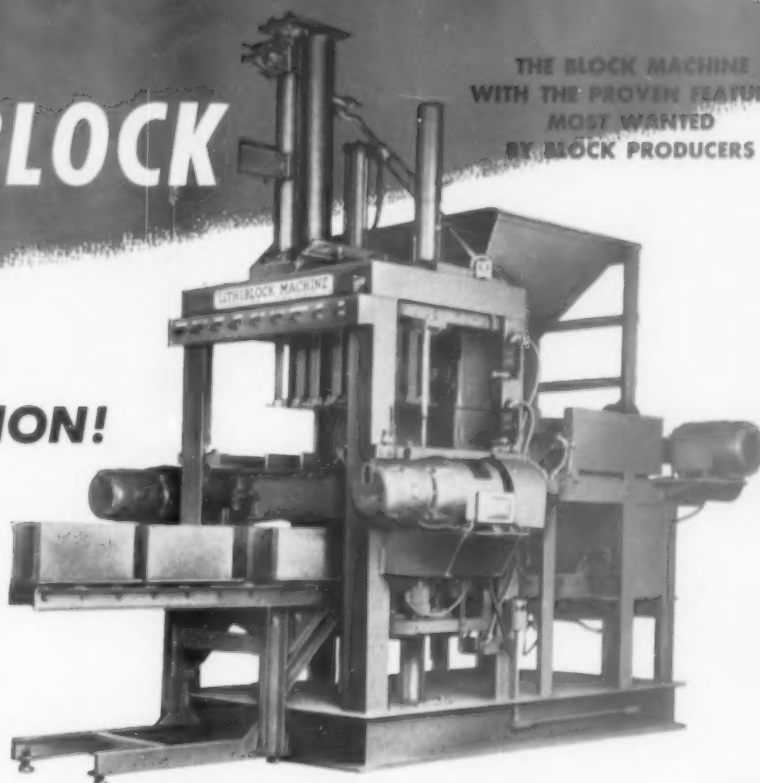
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# LOOK WHAT'S HAPPENED TO LITH-I-BLOCK

THE BLOCK MACHINE  
WITH THE PROVEN FEATURES  
MOST WANTED  
BY BLOCK PRODUCERS

more **SPEED!**  
more **POWER!**  
more **PRODUCTION!**

**NOW**  
**HYDRAULIC or**  
**AIR POWERED!**



## BONUS QUALITY



MADE ONLY ON THE  
LITH-I-BLOCK MACHINE

### ROTA-POSED® AGITATION

No Agitator Grids Needed —  
Rearrange pins to any combina-  
tion of blocks — Fills mold in  
a fraction of the time formerly  
required.

### MICRO-JUSTABLE® VIBRATION

Calibrated adjustable weights  
allow accurate pinpoint selec-  
tion of any intensity desired  
from zero to maximum.

### HYDRAULIC POWER PACKAGE

Produces 12.5% more power  
than used with other block  
machines.

### GUIDED PALLET SUPPORT AND STRIPPER

Extra heavy shafts guide pallet support and  
stripper freely but rigidly in their vertical  
travel — assuring perfect alignment.

### UP TO 1000 BLOCKS PER HOUR

10 Seconds per cycle — 6  
cycles per minute. (Hydraulic  
3-block machine — from actual  
block plant tests)

### 4-POINT HEIGHT CONTROL

Built in — at no extra cost —  
the most positive height control  
on the market.

### QUICK-CHANGE MOLD BOX

The entire machine can be  
changed from one size block to  
another in a matter of minutes.

SALES AND SERVICE THE WORLD OVER

## LITH-I-BAR COMPANY

HOLLAND • MICHIGAN

ONE PIECE OF EQUIPMENT OR A COMPLETE PLANT LAYOUT

LITH-I-BAR CO.

HOLLAND, MICH.

Send me latest bulletin on Lith-I-Block Machine.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY & STATE \_\_\_\_\_

# The STEARNS ELECTRO MATIC is breaking all records!

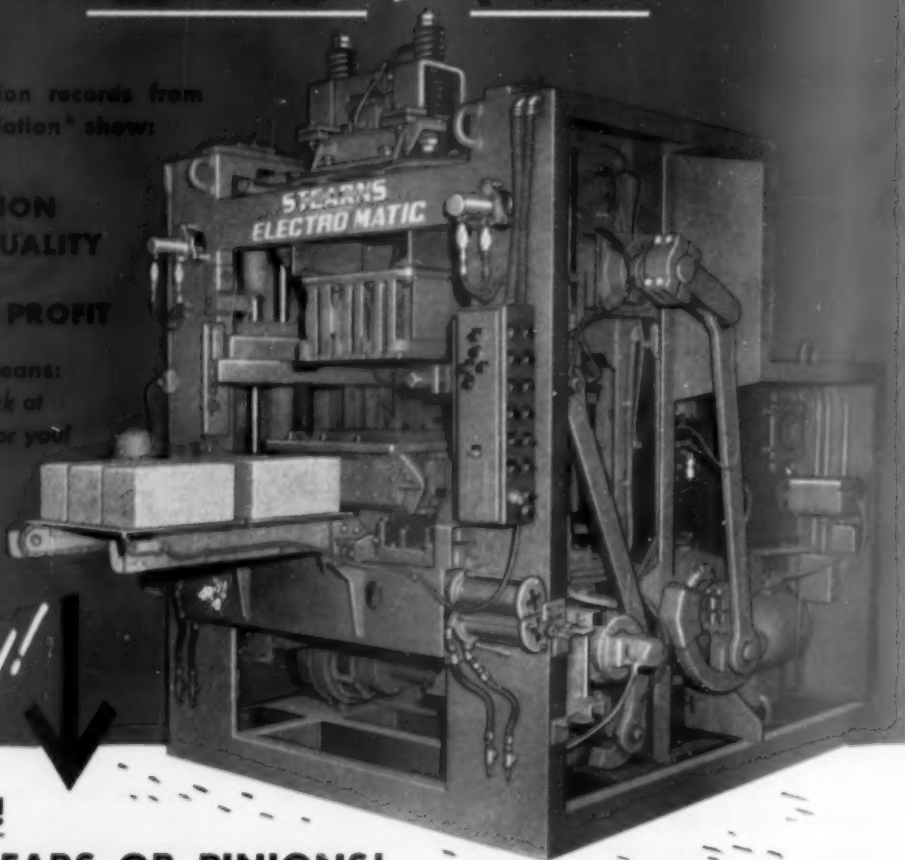
FOR... PRODUCTION *and* QUALITY

Actual production records from  
the latest installation\* show:

- ★ HIGHER  
PRODUCTION
- ★ BETTER QUALITY  
BLOCK
- ★ GREATER PROFIT

Which simply means:  
More quality block at  
lower unit cost, for you!

*...and  
here's why!*



**NO CAMS!**  
**NO OPEN GEARS OR PINIONS!**

The newest proven concept of power application in block machines for faster cycling.

Individual, motor driven, enclosed gear units, provide crank controlled harmonic motion to all functional machine movements, for rapid acceleration and deceleration, and smooth sequence operation. Gear units are interchangeable, with gear running in sealed oil bath for trouble-free operation and service . . . slashes maintenance costs! **UNIFORM COMPACT-ION IN ALL COMPARTMENTS** with Stearns unidirectional dual shaft vibration, stationary mounted, with TWIN 7½ HP 3500 RPM motors. The ELECTROMATIC can be easily converted to 12 inch, or 4 inch high units . . . added protection on your investment, for the growing specialty market. Write today for full information.

**STEARNS**  
MANUFACTURING COMPANY - INC.

ADRIAN, MICHIGAN, U. S. A.

\*Location furnished upon request.

COMPLETE CONCRETE PRODUCTS PLANT EQUIPMENT

designers  
and  
builders  
of  
equipment  
for  
basic  
industries

## Car Feeders



EACH McNally Pittsburgh car feeder has built into it accurate, fast control and rugged power for heavy duty, long-life service.

To Basic Industries  
McNally Pittsburgh Offers:

— SERVICES —  
Research & Development  
Engineering Design Field Erection

— EQUIPMENT —  
Roller Chain Car Dumpers  
Rotary Breakers Car Hauls  
Bucket Elevators Conveyors  
Pumps, Valves, Piping Pug Mills  
Dryers, centrifugal & heat Crushers  
Washers, automatic, Screens  
heavy media & jig Kilns

**M** McNALLY PITTSBURGH  
MANUFACTURING CORPORATION

— OFFICES —  
First National Bank Bldg. 387 N. Michigan  
Pittsburgh, Pennsylvania Chicago, Illinois

— PLANTS —  
Pittsburgh, Kansas Wellston, Ohio

## Used Equipment FOR SALE

- Two Hendrickson 'off highway' bottom dump trucks. Powered by Cummins diesel engines.
- Five Sterling 'off highway' rear dump trucks. Powered by Cummins diesel engines.
- Two Pennsylvania hammermills.
- Stationary Air Compressors.
- 150 Standard Gauge Quarry Cars.
- Three Gyratory Crushers.
- Service Parts for L.J. Mack trucks.
- Waukesha — 140GBZ engine parts and engine.
- Three link belt diesel cranes. Three Marion electric shovels.

**MATERIAL SERVICE CORPORATION**  
JOHN E. FITZGERALD — SURPLUS EQUIPMENT DEPT.  
4226 S. LAWDALE AVENUE, LYONS, ILLINOIS PHONE LYONS 3-8945

## FREE SERVICE for Buyers

— Admixtures, Aggregate  
— Aftercoolers, Air  
— Agitators\*  
— Aggregates (special)\*  
— Air Compressors  
— Air Separators  
— Asphalt Mixing Plants  
— Bagging Machines  
— Bags\*  
— Barges  
— Batchers  
— Belting, Conveyor, Elevator, Power Transmission\*  
— Belt Repair Equipment  
— Bin Level Indicators  
— Bins and Batching Equipment  
— Bits\*  
— Blasting Supplies  
— Block Machines,\*  
— Concrete Building  
— Bodies, Trailer\*  
— Brick Machines and Molds  
— Buckets\*  
— Bulk Cement Handling Equipment  
— Bulldozers  
— Cars, Industrial  
— Central Mixing Plants  
— Classifiers  
— Clutches  
— Coal Pulverizing Equipment  
— Concentrating Tables

— Concrete Forms  
— Concrete Mixers\*  
— Concrete Mixing Plants  
— Concrete Specialty Molds  
— Concrete Waterproofing and Dampproofing  
— Conveyors\*  
— Crushers\*  
— Coolers  
— Cranes\*  
— Curing Equipment  
— Derricks  
— Dewatering Equipment, Sand  
— Diesel Engines  
— Dragline Cableway  
— Excavators  
— Draglines  
— Dredge Pumps  
— Drilling Accessories  
— Drills\*  
— Dryers  
— Dump Bodies\*  
— Dust Collecting Equipment & Supplies  
— Electric Motors  
— Engineering Service, Consulting and Designing  
— Explosives & Dynamite  
— Fans and Blowers  
— Feeders\*  
— Fifth Wheel, Heavy Duty Special  
— Flotation Equipment  
— Front End Loaders\*

— Gasoline Engines  
— Gear Reducers  
— Generator Sets  
— Grinding Media\*  
— Gypsum Plant Machinery  
— Hard Surfacing  
— Materials  
— Hoists  
— Hoppers  
— Kilns: Rotary, Shaft, Vertical  
— Locomotives\*  
— Lubricants\*  
— Magnetic Separators  
— Masonry Saws  
— Mills\*  
— Pipe\*  
— Pumps\*

— Scales\*  
— Screen Cloth\*  
— Screens\*  
— Scrubbers: Crushed Stone, Gravel  
— Shovels, Power\*  
— Speed Reducers  
— Tanks, Storage  
— Tires and Tubes  
— Torque Converters  
— Tractor Shovels\*  
— Tractors\*

— Trailer Dump Bodies  
— Trucks, Bulk Cement  
— Trucks, Industrial  
— Trucks, Mixer Body  
— Trucks, Motor  
— Valves  
— Vibrators  
— Welding and Cutting Equipment  
— Winches  
— Wire Rope

Get information and prices quickly on machinery, equipment. Check item (or items) about which you desire information. Send to us.

\*Specify type.

Send to: Research Service Department

### ROCK PRODUCTS

79 West Monroe St.

Chicago 3, Ill.

If equipment you are in market for is not listed above, write it in the space below.

Your Name \_\_\_\_\_ Title \_\_\_\_\_

Firm Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

RP-6-56

# WHERE TO BUY

## BONDED EQUIPMENT BARGAINS

IMMEDIATE SHIPMENT FROM OUR FACTORY

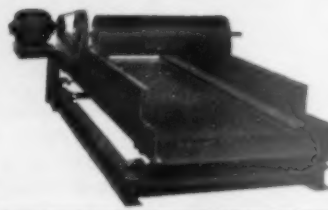
WRITE, WIRE OR PHONE

### NEW BONDED® HEAVY DUTY VIBRATING SCREENS



Model Number	Screening Area	No. of Decks	Sale Price
124AS	2' x 4'	1	\$ 355
224AS	2' x 4'	2	375
126AS	2' x 6'	1	375
226AS	2' x 6'	2	395
126AS	3' x 6'	1	495
226AS	3' x 6'	2	585
326AS	3' x 6'	3	815
138AS	3' x 8'	1	575
238AS	3' x 8'	2	695
338AS	3' x 8'	3	845
138BS	3' x 8'	1	1110
238BS	3' x 8'	2	1165
338BS	3' x 8'	3	1250
248BS	4' x 8'	2	1695
348BS	4' x 8'	3	1850
2410BS	4' x 10'	2	1775
3410BS	4' x 10'	3	2095
3412BS	4' x 12'	3	2395

### NEW BONDED® GENERAL DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS, TYPE BS: 4-bearing positive throw, eccentric shaft; 3' x 8' to 5' x 14', 1 to 5 decks. GENERAL DUTY SCREENS, TYPE AS: eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for new 8-page Bulletin 1086 and 1087. VISIT THE BONDED FACTORY ANY TIME

### NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2 1/2" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, 1/4" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50%



CONVEYOR PRICES INCLUDE BELTING

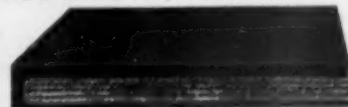
Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	\$1166	\$ 672
14"	50'	2016	1064
14"	85'	3206	1612
16"	20'	1083	592
16"	45'	1928	1012
16"	60'	2494	1264
16"	90'	3529	1767
18"	25'	1327	739
18"	45'	1986	1085
18"	70'	2886	1533
18"	85'	3466	1798
18"	100'	4001	2065
18"	130'	5081	2602
20"	25'	1366	770
20"	60'	2762	1426
20"	75'	3322	1710
20"	90'	3959	1995
24"	25'	1428	835
24"	45'	2227	1237
24"	70'	3226	1744
24"	100'	4425	2339
24"	120'	5225	2744
24"	150'	6426	3352
30"	50'	2669	1504
30"	70'	3576	1971
30"	90'	4483	2432
36"	25'	1632	1040
36"	45'	2492	1561
36"	60'	3327	1950
36"	100'	5102	2990

If you need a conveyor slightly longer or shorter than any of those listed above, you can find the cost by adding or deducting the following per foot prices, according to belt width, for each foot of completed conveyor, including belting as described above.

For 14" belt.....	\$15.86 per foot
For 16" belt.....	16.78 per foot
For 18" belt.....	17.90 per foot
For 20" belt.....	18.95 per foot
For 24" belt.....	20.64 per foot
For 30" belt.....	23.62 per foot
For 36" belt.....	26.60 per foot

### NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck, 1/4" top rubber cover by 1/32" bottom cover, 12 1/2" to 18 1/2" average friction pull, 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	List Price	Sale Price
14"	\$3.43 foot	\$2.75 foot
16"	3.56 foot	2.88 foot
18"	4.27 foot	3.19 foot
20"	4.69 foot	3.60 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.06 foot
36"	6.91 foot	5.00 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/4" top rubber cover x 1/32" bottom rubber cover, 16 1/2" to 19 1/2" average friction pull, 2500# to 3000# average cover tensile belting, or 24 1/2" to 33 1/2" average friction pull, 1960# to 2300# average cover tensile belting. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price	Sale Price
16"	4	\$4.59 foot	\$3.36 foot
18"	4	5.09 foot	3.72 foot
20"	4	5.57 foot	4.03 foot
24"	4	6.56 foot	4.80 foot
30"	4	8.05 foot	5.89 foot
24"	5	7.68 foot	5.61 foot

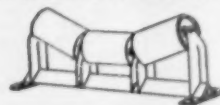
Additional widths and piles available at low prices. Write for Free Sample.

### NEW BONDED® FEEDERS



For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. Feeder may also be driven from tail shaft of Bonded® Troughing Idler Conveyors, thus eliminating the necessity of two motors. Capacities to 225 tons per hour. Full information in Bulletin 1140. Write for it. Priced from .....\$232.00

### NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	\$17.25	24" belt	\$19.75
16" belt	18.00	30" belt	20.50
18" belt	19.00	36" belt	21.25
20" belt	19.25	48" belt	23.75

1-roll, 5" diameter Return Idlers for:

14" belt	\$6.75	24" belt	\$ 8.00
16" belt	7.00	30" belt	8.75
18" belt	7.50	36" belt	9.25
20" belt	7.75	48" belt	10.75

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated sealed ball bearings. Also can be furnished with greaseable type Alomite Fitted bearings. Maintenance is negligible.

### BONDED CONVEYOR ACCESSORIES

All Bonded Troughing Idler Conveyors (described in this ad) can be equipped with any accessory described below or use them on your present conveyor or bucket elevator. Write for Bull. #1138.



Carry Belt Guide Idler \$13.75



Wing Pulley \$69.00



Return Belt Guide Idler \$11.25



Holdback \$96.00



Self-Aligning Idler \$56.50



Head & Tail \$135.00



Roll Idler \$6.75

## BONDED SCALE AND MACHINE COMPANY

PHONE: Hickory 4-2186 Days;  
128 BELLVIEW

WRITE FOR FREE CATALOG AND PRICES

Mfgs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

PHONE: AXminster 1-2213 Evenings  
COLUMBUS 7, OHIO

## WHERE TO BUY

### KILNS—DRYERS—COOLERS

- 1—8' x 125', 3/4" shell.
- 4—7' x 110', 9/16" shell.
- 1—7'6" x 7' x 125', 1/2" shell.
- 2—6' x 74', 3/4" shell.
- 2—7'5"x20', 5'2"x20' Link Belt, Rote-Louvre
- 1—6' x 40', 3/4" shell.
- 1—6' x 40', 5/16" shell.
- 1—4'6" x 50', 3/4" shell.

### CRUSHERS—PULVERIZERS—MILLS

- 2—Allis Chalmers 10" Superior McCully.
- 1—Allis Chalmers k-9 Gates Gyrotory.
- 10—Jaw Crushers 5"x6" to 42"x48".
- 2—Pennsylvania 55XR-100, 100 TPH.
- 3—Hardinge 4 1/2' x 16", 6' x 22", 7' x 36" Ball Mills.
- 3—Patterson 6"x8" Ball Mills.
- 1—Raymond 553 Imp. Mill.
- 1—Dixie 22424 non-clog Hammermill.
- 7—NEW Jeffrey Hammermills 24"x20", 20"x12", 8"x15".

### SCREENS—SEPARATORS

- 3—Tyler Hammer Screens 4'x7', 4'x8', 3'x10', single and double deck.
- 1—Link Belt 3'x8" double deck screen.
- 5—Rotex 40"x84", 40"x120".
- 1—Air Separator 4'.

### MISCELLANEOUS

- 2—Chicago 14"x7" Compressors, 434 sfm.
- 2—Oliver Rotary Dewaterers 8'x4".
- 12—Bucket Elevators 20' to 75' centers.
- 250 ft. Link Belt 12" Traughing Conveyor.
- 1—10,500 gpm Centrifugal Pump 135' head.

Partial List  
Your Inquiries Solicited

## BRILL EQUIPMENT COMPANY

2401 Third Ave. New York 51, N.Y.  
or  
4101 San Jacinto St. Houston 4, Texas

## THREE LIQUIDATIONS

- 2—Raymond 5 roll high side mills, motor driven, complete.
- 1—7' x 48" Hardinge ball mill.
- 1—Patterson 8 x 10' line ball mill, 100 HP.
- 3—Shutz O'Neill style D 28" limited mill.
- 6—Sutton & Steele air tables model VXM-100, 3 nes.
- 4—Rotex 20 x 48"—40 x 84" and 4 x 7' screens.
- 1—American Road jaw crusher model EF-20, 20 HP.
- 3—Roll crushers 20 x 10"—20 x 14"—30 x 14".
- 2—Tyler 4 x 5'—1 and 2 deck screens.

### CHEMICAL & PROCESS MACHINERY CORP.

52 Ninth St. Brooklyn 15, N.Y.

### QUARRY EQUIPMENT

Cedarapids 4032 hammermill secondary unit. Rebuilt.  
Cedarapids model BBB 1008 jaw crusher scalping unit. Reconditioned.  
Cedarapids 4032 hammermill. Rebuilt.  
Cedarapids 3032 hammermill. Rebuilt.  
Cedarapids 2032 hammermill. Excellent.  
Cedarapids 42" x 18" apron feeder.  
Williams 20' pulverizer.  
McLanahan 13" x 20' log washer with V-belt drive.  
12' x 35' inclined open elevator. New.  
Helsol 40' x 12' 75 ton per hour enclosed elevator.  
27 1/2 ton single compartment 8'x12' bin.  
60-ton, 2-comp., 8' x 18' storage bin w/clam gates.  
100-ton, 2 comp., 13'x23' bins.  
Special bins to your specifications.  
Conveyors—14"-24"-30"-36" Also belting.  
18" dia. x 20' face magnetic pulley.

### SHOVELS AND CRANES

Osgood Model 903 2 yd. diesel or crane.  
Lima 34 Paymaster 3/4 yd. diesel. Very good.  
Brownhotel 1-yd. gas shovel-crane.  
Lorain Byers 83 diesel backhoe.  
Lorain MC-414 20-ton truck crane. Excellent.  
Lorain TL-20 4x4 self-propelled. Reconditioned.  
Lorain TL-20 8x4 15-ton truck crane. Reconditioned.  
Lorain TL-25-8 3 1/2 yd. diesel, wide gauge crawler.  
Insley Model K12, 1/2 yd. crawler clam-crane. Good condition.  
Unit 1014, 6x4 motorcrane.  
Michigan C16, 1/2 yd. crawler shovel.

### TRACTORS, TRUCKS, SCRAPERS, ETC.

- 3—Euclid rear dumps, 22 ton. Good condition.
- 2—Cat DW15 scrapers. Excellent condition.
- 3—Cat DW19 scrapers. Good condition.
- 1—Allis-Chalmers HD16 with Baker bulldozer.
- 1—Int. TD16 with Bucyrus-Erie bulldozer blade.
- 1—Woolridge 15-18 yd. Model TCR scraper. Rebuilt.

### DIESEL POWER UNITS

Caterpillar D7780, 63 H.P. @ 1000 RPM. Rebuilt.  
Caterpillar D13000 6-cyl. diesel engine. Twin Disc clutch, extended shaft, outboard bearing.  
145 H.P. @ 1000 RPM. Rebuilt.  
Caterpillar D17000 8-cyl. diesel complete with radiator and clutch.

### ASPHALT PLANT

Barber-Greene model 848 with drier, gradation unit, etc.

### AIR COMPRESSORS

600 cu. ft. Gardner-Denver diesel, practically new.  
500 cu. ft. Gardner-Denver diesel, rebuilt.  
500 cu. ft. Ingersoll-Rand Waukesha. Reconditioned.

### L. B. SMITH, INC. CAMP HILL, PA.

Phone Harrisburg REgent 7-3431

### TRANSIT MIXERS

Jaeger 3 Yd. Hi-Discharge, (4 1/4 yd. Agitator) un-mounted, reconditioned.  
Jaeger 3 Yd. Hi-Discharge, (4 1/4 yd. Agitator), mounted Int. "K-11" 6x6. Very clean, (2).  
Jaeger 3 Yd. Hi-Discharge, (4 1/4 yd. Agitator) mounted Int. "LF170" Tandem.  
Rex 3 Yd. Hi-Discharge (4 1/4 yd. Agitator), un-mounted.

### MISCELLANEOUS

Link-Belt "LS-85" Reconditioned 3/4 yd. Diesel Shovel.  
Caterpillar "D6" Used Tractor w/Trackson Loader, cab, 1950 Model.  
Galion "116" Used Diesel Motor Grader.  
Unit Shovel Attachment complete, for Unit "514" 3/4 Yd.  
Unit "514" Used 1/2 Yd. Trench Hoe or Dragline, gas power. Priced to sell quick.  
Barber-Greene "522" Bucket Loader, pneumatic-tired.  
Simplicity 3 x 8 New 3-Deck Screen—Sacrifice at our cost.  
Note: Above equipment belongs to us.  
Located in our yard.

### EIGHMY EQUIPMENT CO.

120 S. Pierpont Rockford, Ill.  
Phone 4-6706

### SHOVELS—CRANES—DRAGLINES

Northwest 8, 1 1/2 yd., dragline crane, 90' boom.  
R-E 22B 1/2 yd. Shovel-Crane-Bachhoe-Drage.  
Northwest 80-D Diesel Shovel 2 1/2 yd. New 1952.  
Lorain L-870 3 yd. Shovel-Drage-Crane 100' ton.  
Bue-Erie 54-B Diesel Shovel, 2 1/2 yd.  
Murphy Diesel.  
Lorain Model MC 254W truckcrane 25 tons rap.  
Bay City 100761 truck crane 25 tons rap. Diesel.  
Link-Hell HC30 truck crane 25 tons rap. alloy boom.  
P&H 225A truck crane 20 tons rap. 90' boom.

### LOADERS

Hough Model HM 1 1/2 yd. Pay Loader.  
Hough Model HMD 1 1/2 yd. Diesel.  
Euclid Model 10YB Cummins Diesel.  
Hough TD9 1 yd. bucket (Diesel).

### CRUSHERS—KILNS—DRYERS

JAW: Acme 10x30, 14x20, 14x25, 10x45, 18x32, 18x32, 25x40, Eagle 20x36, Diamond 24x36, Cedar Rapids 10x20, 20x36, 25x40, Farrell 10x20, 18x30, 14x20, 18x30, 30x48, Buchanan 30x42, Good Roads Reliance 15x30, Traylor 18x30, 24x30, Allis-Chalmers 30x18, Good Roads 10x30, Telsmith 18x32, Traylor 48x80, 42x48, Allis-Chalmers 42x40.  
GYRATORY: All-Chal 22' 6" 7 1/2", 8, 6, 9K, 10, 20 and 30 Telsmith 512, 28" Intercore, Kennedy Van Naut 7, 10, 25 1/2", 8, 37 1/2", 38; Traylor TT 1 1/2", 4" Type T8.

ROLL: Cedar Rapids 40x30, Pioneer 40x32, Pioneer 18x32, Telsmith 24x16, Universal 40x24 double.  
HAMMERMILL: Jeffrey Type B3 24x30, Type B 36x24, 36x28, 36x42, Eagle 24x24, Stedman 24x30, Cedar Rapids 30-50, 30x25.  
BALL MILL: K.V.R. Type M 6'x8' Alwaynt, Marcy No. 615, Hardinge radial 10'x18", 10'x36" 7'x27", 6'x12", 5'x7", A.C. 6'x16".  
TUBE MILLS: 5'x16", 5'x20", 5'x22", 6'x12".  
ROD MILL: Jackson & Church 4'x10' 10 ton rods, new, Marcy 388, 5x12, 6x12, Bush 4'x11".  
AUTOCRAVER: Jackson & Church limited head 50'x6" "Quick Acting" head 30'x6".  
CONE: Symons 2' and 3' coarse bowl.  
KILNS: 4'x12", 5'x30", 6'x30", 6'x40", 7'x110", 10'x105", 8'x10".  
DRYERS: Louisville 6'x30", 6'x50", others 4'x40", 7'x80", 10'x100".  
COMPEL MILLS: A.C. 7'x24" with motor drive.

### CRUSHING PLANTS

Cedar Rapids 2036 Primary 75 HP GM Diesel.  
Pioneer 150 Primary 3036 Cat D6800 Diesel.  
Pioneer Secondary 1022 roll Cat. D 12000.  
Cedar Rapids "Pitmaster" port. washing-screening.  
Pioneer 305W, crushing, washing, screening.  
Cedar Rapids 40x33 Port. Secondary, Diesel.  
Universal Model 880 Port. Gravel Plant.  
Pioneer Port. 11x36 jaw, 40x30 rolls.  
Diamond 66, Port. Prim. 1036, Secondary 3018.

### CLASSIFIERS

Conveyo 4'x10' sand-dewatering pump and motor.  
Dorr 6'x27" Duplex, flake type.  
Hardinge 6'x18" counter-current scrubber.  
Telsmith Twin Screw Washers 18'x11' 3".  
Dorr Type D6PH 30'-dia. bowl.

### CONCRETE PLANTS AND EQUIPMENT

Noble CA-245, complete plant, almost new.  
Noble CA-155 3 comp., 150 ton bin.  
Erie Strayer port. 25 yds. per hr.  
Mixermobile 2 yd. 35' tower. Extension to 105' c. s. Johnson 4x2 tub with gravel plant.  
Cement silos, Corps of Engr. Spec.  
Johnson concrete plant 300 yds. Corps Engr. Spec.  
5 aggr. concrete, cement silo 2700 bbls.  
B & 400 bbl. cement bin, 400 ton silo.  
Noble Model CA-154 Concrete Plant.

### SAND AND GRAVEL HYDRAULIC DREDGES

Morris 16' x 11'. Portable. Electric.  
10' Portable Diesel powered. Complete.  
12' Diesel powered, pontoon mounted. Complete.  
Elliot 8' with motor. Diesel Hull 8'x18'x6", 8' Hydraulic Diesel On 32'x38' steel pontoons.  
Amson 10' Diesel power portable. Excellent.  
6' portable Diesel complete with cutters, etc.  
8' H-P twin Diesel drive. Complete.

### DERRICKS

American 30 ton Guy Derrick 106' boom, 116' mast.  
Special 35 ton stiff leg derrick, 100' boom.  
Nat'l Bridge 30 ton Guy Derrick, 100'.  
American 30 ton stiff leg, 100' boom.

### SCREENS

Driester 4'x8' 3 deck.  
Simplicity 3'x8' 3 deck.  
Ames 5'x24' revolv. scaling with motor.  
Ames 5'x24' revolv. grading with motor.  
New Holland 4'x12' 4 deck.  
Diamond Model D1W3 3 deck 4'x12'.  
Tyler 4'x10' two deck heavy duty motor. Gen. Set.  
Telsmith 5'x12' dbl. deck elec. motor.  
C. R. 4' x 12' dbl. deck Elec. motor.

### RICHAUD P. WALSH CO.

30 Church St. New York, N.Y.  
Cortland 7-0723 Cable: RICHWALSH


### PUMPS—PUMPS—PUMPS

SAND—TAILINGS—SLUDGE—SLURRY  
ABRASIVE & CORROSIVE LIQUIDS  
CAST IRON AND STAINLESS STEEL  
FULL LINED AND PARTIALLY LINED  
SIZES 2" TO 14" — CALL OR WRITE

Krogh Pump & Equipment Co., Inc.  
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LOW COST—DEPENDABLE  
INDUSTRIAL RUBBER PRODUCTS**



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Air	Solvent	Discharge	Oil Suction	Suction	Vacuum
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**RUBBER BELTING**

Conveyor	Grader	Hot Material	V-Belts
Elevator	Chute Lining	Mucker	Transmission

**CARLYLE RUBBER CO., INC.**

103-107 Warren St., New York 7, N. Y. DIgby9-3810

PROMPT  
SHIPMENTS  
LOW COST  
QUALITY  
PRODUCTS

#### SPECIALS

- 2—New 4 1/2' x 150' Kilns.
- 1—Complete Lime Hydrating Plant.
- 1—4 Williams Jumbo hammermill.
- 1—25" Telemith Intercone Crusher.
- 2—#380 Allis-Chalmers hydrocone crushers.
- 1—10x30 Gruendler Roller bearing jaw crusher.

#### KILNS

- 1—4 1/2' x 40', 8' x 125' & 8' x 10'x130' Kilns.

#### DRYERS

- 1—4 1/2'x30', 5'x30', 8'x125'.

#### CRUSHERS

- 1—48" x 42", 18" x 36", 12" x 24" Jaw Crushers.
- 2—42" x 16" Allis-Chalmers Crushing Rolls.
- 26" x 16 rebuilt Sturtevant rolls.
- 2—24" x 14" Rogers Iron Works Crushing Rolls, Rebuilt.
- 1—24" x 12" Farrell Bacon Crushing Rolls.
- 1—6", 10", 16", 20" McCully Superior Gy-ratory Crushers.
- No. 8 up to No. 12 Gyratory Crushers.

#### BALL, ROD & TUBE MILLS

- 1—6'x12', 5 1/2'x10' Ball Mills.
- 2—6'x12', 1—5 1/2'x10' Rod Mills.
- 2—6 1/2'x20', 5'x22' & 6'x22' Tube Mills.
- 2—6'x22' Compeb Mills.

#### MISCELLANEOUS

- 1—14' Air Separator.
- 1—6'x4', 12'x10' Olive Filters.

We make new dryers and kilns.

Have you any machinery that you  
want to sell?

**W. P. HEINEKEN, INC.**

50 Broad St., N. Y.

Tel. Wh. 4-4236

**WANT TO BUY  
ROTARY DRYERS  
ROTARY KILNS  
BALL & ROD MILLS  
DIESEL LOCOMOTIVES  
R. C. STANHOPE, INC.  
60 E. 42nd St., N.Y. 17, N.Y.**

**DOER CLASSIFIER AND WASHER:** 12'x30'x 2 1/2', quadruplex wood tank, with 30 H.P. motor. Condition excellent.

**DOER TROMMEL:** 5' to 6' dia., 10'6" long, with motor.

**FLOTATION EQUIPMENT** complete including pulp sampler and distributor, mineral jig, 6 cell flotation machines, super charger, agitator, 4" concentrate pumps, reagent distributors, etc. Used only 300 hours.

**WEMCO MOBIL SINK FLOAT PLANT** with 10 ft. cone, etc.

**FEEDER:** Robins heavy duty Ore Rock Feeder 60" x 14 ft. with 30 H.P. motor, reducer, etc. New condition.

**FAN CONVEYOR:** 48" x 110 ft. complete with motor, reducer, etc., heavy duty type, designed for rock.

**BALL MILLS:** 9'6" x 11'. NEW. Two Allis Chalmers 5' x 22' Tube Mills with steel heads.

**ROD MILLS:** 2—Marcy Open End size 5' x 14'.

**DRYERS:** 2—Heavy duty 9' x 70' with all equipment, new condition.

**JAW CRUSHERS:** 10 x 20, 18 x 30, 18 x 36, 24 x 30, 30 x 42, 42 x 40, 48 x 60, with or without motors.

**LOCOMOTIVE CRANE:** 35 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1 1/2 yd. Williams dam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

**MINE HOISTS:** Single and double drum 100 to 1500 H.P., with all electrical equipment. Complete specifications, drawings, photos available.

**MOTORS:** 1—700 H.P. and one 450 H.P. synchro motors, 180 RPM, 2200/4160 volts, with controls. NEW. UNUSED. One O.E. 50 H.P., 2200 volts, 3 phase, 60 cycle, 480 RPM, with control equipment.

**WE BUY AND SELL EQUIPMENT THROUGHOUT  
NORTH AND CENTRAL AMERICA**

**A. J. O'NEILL**

Lansdowne, Pa.

Phila. Phones: MAdison 3-8300—3-8301

Gardner Denver Horizontal Air Compressor, two stage, 12 1/2"x8 1/2", Model HAB, s/n 94558, 500 cu. ft./min., 125 pounds pressure, with Louis Allis Squirrel Cage Motor, 100 HP, 440V, s/n 601739. All attachments for operation. Condition Good.

**GEO. W. KERFORD QUARRY CO.**  
P.O. Box 468, Phone 1206, Aitchison, Kansas

40" x 21' Dryer, hoods, burner.  
36" x 25' Dryer, parts only.  
42" x 12' Air Tank 1/2" shell.  
National 25 HP D.D. Dragline Hoist.  
Lambert 2 Drum Derrick Hoist 50 HP.  
Lidgerwood 1 Drum 30 H.P. Dock Winch.  
Stroudsberg 1 Drum Hoist Size 500.  
Sullivan 1 Drum Electric Tugger Hoist.  
15 Ton Stiffleg, 110' Boom.  
Jeffrey Apron Feeder 30" x 33'.  
Apron Feeder 18" x 5 1/2'.  
Encl. Screw Conveyor 84" x 12".  
69—36" Trough Idlers 5 roll type.  
58—30" Trough Idlers Misc. types.  
106—42" Trough Idlers, antifriction.  
135—48" Trough Idlers, antifriction.  
Conveyor Pulleys, 30" D. x 60" Face  
V-Belt Sheaves, approx. 250.  
399' Used 36" Conveyor Belt 5 ply.  
158' Used 42" Conveyor Belt 7 ply.  
240' New 42" Conveyor Belt 8 ply.  
Reliance Reval. Screen 36" x 20'.  
Hummer Type 31 D.D. Screen 6 x 5.  
Cedar Rapids D.D. Screen 3 x 10.  
Abbe Turbo-Sifter #2 Blutergess.  
Kennedy #195 Gearless Gyrotory.  
Dodge Lever Type Jaw Crusher 9 x 15.  
Climax Jaw Crusher 10 x 20.  
Acme Jaw Crusher 14" x 26".  
Acme Road Mach. Jaw Crusher 10 x 18.  
American #135A Hammermill.  
5—5' and 6' Pebble Mills.  
Barber-Greene 12" Bucket Loader.  
Dings Cracker Magnetic Separator.  
Simplex & Duplex Bin Gates.  
4—Easton Dump Cars 24" ga. 1 1/2 yd.

**G. A. UNVERZAGT & SONS INC.**  
136 Coit Street Irvington 11, N.J.

## SHOVELS—DRAGLINES DRILLS TRACTORS—TRUCKS

190-B Bucyrus Erie Elec. 8 yd. Shovel  
170-B Bucyrus Erie Elec. 6 1/2 yd. Shovel  
120-B Bucyrus Erie Elec. 5 yd. Shovel  
1600 P&H 6 yd. Electric Shovel  
2400 Lima 6 Yd. Diesel Shovel  
111-M Marion 3 1/2 yd. Diesel Shovel  
955 P&H 2 1/2 yd. Diesel Shovel  
54-B Bucyrus Erie 2 1/2 yd. Diesel Shovel  
80-D Northwest 2 1/2 yd. Diesel Shovel  
222-B Bucyrus Erie 1/2 yd. Shovel  
7400 Marion Elec. Drag 200' boom, 8 yd.  
625 Page Diesel Drag 160' boom, 9 1/2 yd.  
2400 Lima Diesel Dragline 120', 5 yd.  
4500 Manitowoc Diesel Drag 120', 5 yd.  
1055 P&H Diesel Dragline 80', 4 yd.  
3500 Manitowoc Diesel Drag, 85' 2 1/2 yd.  
595 Link Belt, 75', 2 1/2 yd., independent boom hoist  
600 Reich Heavy Truck Mounted Rotary Drill Quarrymaster Drill with 2-500 cu. ft. compressors  
58-BH Joy Champion Rotary Air Drill Also 42-T, 29-T & 27-T Well Drills  
EUCLED TRUCKS—Many to Choose From

**FRANK SWABB EQUIPMENT CO.,  
INC.**

313 Hazelton Net'l Bank Bldg.  
Hazelton, Pa. Gladstone 3-3658

## WHERE TO BUY

**Cedar Rapids 20x36 Portable Jaw Primary Plant**, mdl. AAA, also with 3x12 heavy duty apron feeder, by-pass chute, 30"x27" underconveyor, GMC diesel power, factory mounted on tandem oscillating axles, gears, tires, air brakes. Overhauled & Reconditioned. Ser. 10060. Excellent. \$10,000 Cedar Rapids, Ia. Also another one as above but with 75 hp. electric motor and shorter 3rd apron feeder. New shaft & brgs. \$14,500 Rental Purchase.

**Universal Secondary Portable Plant**, w/30x18 r.b. Double Roll and #1 Universal hammermill, 4x12 2-deck vibr. Screen, rotator, Dodge diesel power, 30" conveyor system, diesel electric generating set, mounted on tandem rubber, front dolly, Good. \$17,500 Rental Purchase.

**Universal Stationary Plant** w/18x26 r.b. Jaw Crusher, apron feeder, 18x20-18x25 and 18x50 conveyors, 4x10 2-deck Saco screen, Pioneer 21 c.p. bin, 30x36 Dixie hammermill, Lorain T150 diesel Shovel, power units, 210 air compressor & wagon drill. Late models, good. \$20,000 Rental Purchase.

**Stationary Plant**, w/24x36 r.b. Gruendler Jaw crusher, 18" apron feeder, 48x25 Iowa hammermill, 4x12 Iowa 2-deck screen w/motor, L&S diesel Shovel, 315 diesel air compressor, wagon drill, 24x100-24x50 conveyors, 2 Cummins NH18 diesel power units, 1 Cummins 4 cyl diesel power unit, late models, good. \$40,000 Rental Purchase or will sell any major part.

**Austin Western**, 12x20 r.b. Jaw Crusher w/gas power unit, underconveyor on steel wheels, Good. \$1750 Yard.

**Austin Western** 10x10 r.b. Jaw Crusher, very good. \$1850 Yard.

**Allis Chalmers** 5x10 2-deck Lo Head Horizontal Screen, w/spray bars and electric motor. Brand new. Never used. Cost over \$5500. Our price \$1800.

**SECO** 4x10 2-deck Screens, type S, model 338 with Case gas power unit. Good \$1850.

**Caterpillar** D137 Diesel Power Unit, ser. 228163 with rotary air clutch, V-pulley, extended base, 6 mos. old, used only 400 hrs. Like new. Cost over \$8500. Our price \$4250 Rental Purchase.

### WENZEL MACHINERY RENTAL & SALES CO.

565 S. 10th Mayfair 1-1710 Kansas City, Kans.

### FOR SALE BY OWNER

- 1 Hammermill—24"x24" Eagle
- 1 Locomotive—8 ton, 36" gauge Plymouth gasoline
- 1 Locomotive—12 ton, 36" gauge Plymouth gasoline
- 22 Cars—3 yard capacity, 36" gauge, Atlas Car and Manufacturing
- 2 Pumps—2" Model C Wilfley
- 1 Screen—3' x 8' single deck, W. S. Tyler de-watering
- 6 Pumps—2" Bingham Pump Company—Service liquid flotation feed 35' head, 475 G.P.M.
- 16 Pumps—4" Bingham Pump Company—Service liquid flotation feed 55' head, 290 G.P.M.
- 6 Flotation cells—Morse-Weining type. Size 42" x 42" x 48"

For further information contact J. H. Clements:

### BASIC INCORPORATED

P.O. Fostoria, Ohio Maple Grove, Ohio

### FOR SALE

**Crusher**—42 x 40 Farrell "B" Jaw Crusher with apron feeder and 150 HP motor

**Classifier**—Dorr 26' bowl with 5' x 30' rakes

**Hammermills**—Jeffrey 42 x 24 and Pennsylvania S-6

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Assistant to Superintendent of stone quar-  
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BOX N-65, ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill.

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Box O-46, ROCK PRODUCTS

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BOX O-42, ROCK PRODUCTS

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Kent Model #3 Continuous Mixer  
Abbe 37" x 30" Ball Mill Chrome-Mang. lined.  
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Box O-39, ROCK PRODUCTS

79 W. Monroe St.

Chicago 3, Ill.

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RP-6-56

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